Safety Maintenance

EST. 1901 • AMERICA'S PIONEER MAGAZINE IN ITS FIELD • JULY, 1959 • 50¢
Published By Alfred M. Best Company, Inc.

Hands that forge the tools...

...that make the equipment...that safety men use ...to create a nation of the best-protected workingmen in the world. This is the Industrial Safety Equipment Association, Inc. Here ideas and techniques are exchanged to accelerate progress and to protect men's lives. Today—25 years after its founding—with the world on the threshold of the atomic age, the ISEA pledges itself again to keep pace with new equipment and ideas... to make lives more secure and work more safe.

25th anniversary ISEA

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Standard Safety Equipment Company
Stonehouse Signs, Inc.
United States Safety Service Company
Watchemoket Optical Co., Inc.
Welsh Manufacturing Company
Willson Products Division, Ray-O-Vac Co.

BULLETINS & CATALOGS

As a convenience to executives, these new publications of manufacturers are offered by the Reader Service Department of SAFETY MAINTENANCE. To obtain copies write in the key numbers on the free-postage card below.

MATERIALS HANDLING

Warehouse Operations 418
Lewis-Shepard Products, Inc. This 4-page bulletin presents an illustrated case-history of the materials handling operations at a major drug company. Shows how various models of electric fork lift trucks are used in receiving, storage and shipping operations.

Manual Cranes 419
Wright Hoist Div., American Chain & Cable Co., Inc. Informative folder gives descriptive and technical data on top-running, single-bridge, hand traveling cranes, in capacities from 1 to 10 tons. Bulletin features construction, weight, dimension, safety factor, etc., for application where accurate spotting is more important than speed.

Inclined Belt Conveyors 420
Sage Equipment Co. This 12-page portfolio of specification sheets gives working data on inclined belt conveyor units covering a wide range of sizes for floor-to-floor use. Also outlines the guard rails and other auxiliary equipment for these gravity wheel or power driven conveyors.

Electric Hoists 421
Hoist & Crane Div., Robbins & Myers, Inc. A new 12-page bulletin describes and illustrates a line of low-headroom electric hoists. Included are construction details, mounting information, performance data and dimensions.

Chain Safety Booklet 422
The McKay Company. "Vital Links to Safety" is the title of this well-planned and informative booklet that outlines the fundamental safety precautions for the use and care of industrial chains. Cleverly illustrated with cartoon drawings, the booklet covers: chain safety terms, proper use of chain, safety cautions, proper inspection, working load limits.

Industrial Truck Selector Guide .. 423
Automatic Transportation Co. Designed to assist in the setting up or revision of materials handling systems, this 20-page illustrated guide gives data on over 150 models of industrial trucks and tractors, outlining such selection factors as: capacity, frequency of use, power source, semi-standard or special models. Includes facts on selection of pallets and skids, attachments, special die handlers, etc.

Fork Truck Catalog 424
Elwell-Parker Electric Co. This condensed catalog of fork trucks contains detailed engineering data, specifications, and operating information on more than 25 fork truck models. Illustrated catalog also has a section on attachments suitable for various models.

PERSONAL PROTECTION

Cup-Type Safety Goggles 425
Bausch & Lomb brochure describes new, improved welders' and chippers' cup-type goggles with detailed illustrations of special safety construction. Thermo-plastic goggles are designed to resist high impact and shaped to the head for comfort. Literature also includes information on B & L shields.

Protective Clothing 426
Workon, Inc., literature illustrates new protective clothing for body, head and feet with custom designs for all industrial requirements—factories, plants and laboratories. Special emphasis on an armored jacket for lab wear.

Fumigant Masks 427
Acme Protection Equipment Co. bulletin details information on history, use, hazards and protection for users of modern insecticides, and describes mask equipment available. Included in the bulletin are special cautions and instructions.

Safety Spectacles 428
Wilkie Optical Co. The "GW" Safety Spectacle series is featured in a bulletin that describes new spectacles, and provides complete information on sizes, features and protection offered by this safety eyewear.

MAINTENANCE

Engineered Maintenance 429
Puriten Chemical Co. provides complete information on its new "Engineered Maintenance," a sanitary maintenance management program applicable to factories, office buildings and institutions. The individually planned program applies engineering techniques to specific requirements, organizes custodial work, sets up automatic controls and provides for follow-through and review.

New Scaffold 430
Building Service Co. Brochure on all-steel wheeling scaffold with safety features: nonslip locks, built-in ladder feature, adjustable height. New scaffold can be disassembled for moving convenience, adjusted for split level work and wheeled anywhere.

Brick Repair 431
Master Builder Company has developed a non-shrink mortar for the repair of worn or corroded brick and tile floors. The publication fully explains and illustrates procedures for repair of floors.

Open Flooring 432
Blaw-Knox literature describes and illustrates use of open flooring in industry, with

(Continued on the next page)

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Free Bulletins (Cont'd)

special attention to grating applications in sidewalks, locks and dams, sewage treatment plants. Information includes types and spacing, bearing bar surfaces and weights, fastening methods and safe loads for electro-forged carbon steel and aluminum interlock grating. Stair treads are also described.

Matting Blueprint 433
American Mat Corp. brochure contains detailed description of all types of safety, comfort and scrapeage matting. It includes a floor plan of a typical industrial plant with indication of the proper mat material for each area.

MISCELLANEOUS

Glass Safety Tips 434
Libbey, Owens, Ford booklet gives tips for cutting safety plate glass, with illustrations and instructions for shop layouts, storage facilities, methods of handling glass, and installation. Included is a bibliography as well as considerable data on other kinds of glass and plastic.

Guards 435
D & M Co. brochure illustrates and describes woodworking machine guards with state and insurance authority approvals, stressing safety requirements to fully protect worker at specific equipment. Text emphasizes fact that added protection against injury will increase profit. Includes guards for circular and band saws, jointers, and shapers.

State Regulations 436
R. E. Dietz Co. Bulletin lists state by state regulations on automotive safety equipment and turn signals. All 1959 rulings are included with specific coverage on such equipment as fire extinguishers, electric and reflector flares, fuses, indentification lamps, etc.

FIRE PROTECTION

Dry Chemical Fire Extinguishers.. 437
Walter Kidde brochure outlines "how to use" and "recharge" techniques for dry chemical extinguishers, ranging from 2½ to 30 pound models. Accessory equipment is illustrated. Also covered in the four-page bulletin are Class A, B & C fires and the approved extinguishers for each, fire detection equipment and cylinders.

What's YOUR Problem?

- **Has an accident or fire interrupted production?**
- **Want to know how to prevent it?**
- **Do you need background information on equipment for industrial safety, hygiene, or maintenance?**

As a service to its readers, "Safety Maintenance" will arrange to supply manufacturers literature on the following subjects. Just insert the key number on the Readers Inquiry Card on the preceding page and be sure to fill in your name and address. If you need information on a specific type of product, simply write it in on the Inquiry Card.

Key Number	Subject
	PERSONAL PROTECTION
101	Safety Goggles
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104	Sweat Band
105	Hard Hats
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Key Number	Subject
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184	Safety Lock-Outs
	EDUCATIONAL AIDS
191	Safety Signs
193	Employee Safety Guide
195	Changeable Letter Signs

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Publication Office:
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Safety Maintenance

formerly "SAFETY ENGINEERING"

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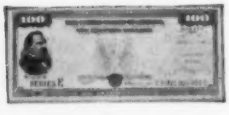
L. P. HOLLAND, skilled refinery technician, is typical of thousands of key employees in this field who are buying U.S. Savings Bonds regularly. Mr. Holland, through his company Payroll Savings Plan, is making a personal contribution to the Peace Power of our country.



SAFETY MAINTENANCE

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Way ahead in VISION... Way ahead in VENTILATION

NEW!

AO "Kool-Vent" Face Shield (No. 283)

Ever see a face shield *like this?*

It's a real "natural" — never before have you seen a shield like it with protection, vision and comfort combined.

There's no screen before the eyes to impede vision but plenty of 24 mesh screen elsewhere for good ventilation. The clear acetate window permits unobstructed vision. Workers can do a better job. No wonder this new AO Face Shield has been enthusiastically received wherever it has been shown. It is available with clear, green or aluminized windows.

Recommended for hot operations or *any* operation where a man wants the best combination he can get of vision and ventilation.

Back headband is fiber, adjustable, fits lower head snugly, comfortably. The long band slides within a fiber sleeve — permits easy nut adjustment for head size and prevents hair pulling.

AO H-3 Face Shield
— Same as AO #283 except entire window is acetate.

AO H-1 Face Shield For operations where no standard spark deflector or forehead guard is required. Adjustable elastic headband may be worn low on head for extra comfort. Standard leather sweatband and window, snap-on type.

FEATURES — AO 283 and H-Series Face Shields

- Slotted window permits expansion and contraction. Heat won't warp or distort.
- Most models with deep spark deflector.
- All vulcanized fiber parts of rugged construction (specification thickness).
- Windows set out extra inch for clearance and ventilation.
- Genuine leather sweatband, easily removed for sterilizing.
- Automatic friction joints. No turning or tightening.
- Jointed rear headgear for better fit and anchorage.
- Easy rear adjustment to head size.

Always insist on American Optical *Trademarked Safety Products*

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COMPANY
SAFETY PRODUCTS DIVISION
SOUTHBRIDGE, MASSACHUSETTS
Safety Service Centers in Principal Cities

YOUR NEAREST AO SAFETY PRODUCTS REPRESENTATIVE CAN SUPPLY YOU

(For details, use Key # G-1 on card on page 1)

Hood's new Koroseal Flexigluvs* are made with an exclusive premium quality PVC compound, — "Koroseal", the most famous name in flexible vinyls. By actual test, the new Flexigluvs offer far greater resistance to solvents and light oils than ordinary plastic gloves. Flexigluvs perform satisfactorily where other plastic gloves fail.

The new blue color identifies this jersey-lined Koroseal work glove that combines excellent abrasion resistance, maximum flexibility at low temperatures, with unsurpassed protection against hundreds of alkalies, salts, solvents, oils, greases, soaps, detergents, dyestuffs, etc. Also, the new Flexigluv has no obnoxious odor. Blue Koroseal Flexigluvs are available in fully-coated #K200—knit wrist;—#K201 12" gauntlet; and #K202 14½" gauntlet.

FOR FULL INFORMATION AND PERFORMANCE CHART WRITE TO:

Hood Industrial Gloves
Watertown 72, Massachusetts

*Trade Mark

KOROSEAL • NEOPRENE • RUBBER

(For details, use Key # G-2 on card on page 1)

CHECK LIST of aids to production

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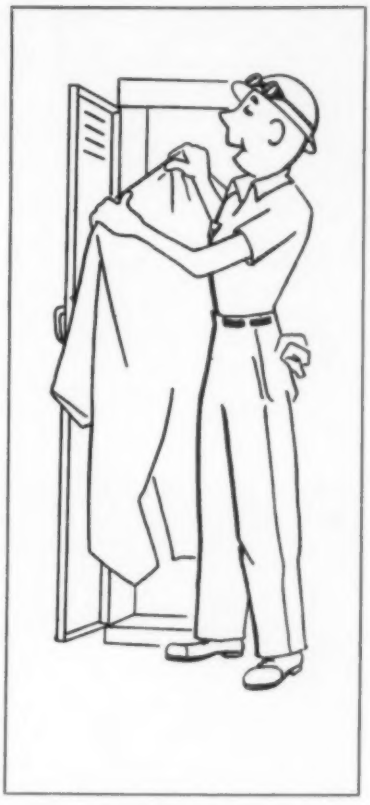
Who's Your Safety Tailor?



When the steel industry coined the phrase "Safety First, Quality Second, Production Third" and put it to deeds in 1899, it set off a chain of events that was to save many an American life.

Early efforts were directed toward engineering the hazards out of plant equipment and environment, and engineering safety in. Then more and more attention was turned to the steelworker's personal protection. There were jobs where potential hazards could not be entirely eliminated by engineering—tapping furnaces, pouring steel, welding and working with acids and gases. There was also the inevitable problem of human thoughtlessness.

PROTECTIVE CLOTHING SERIES
other articles Aug. & Sept.

Men working around blast and open hearth furnaces had learned early from experience that woolen clothes (which are still in favor) were best for their jobs, because they were much less likely to ignite when splashed with hot metal. Leather, too, had long been used where less heat was present. But it was not until some 25 years ago that engineers and manufacturers began concentrating on protective clothing.

Today there is special purpose clothing for some of the steelmaking jobs, such as asbestos coats for

Aluminized asbestos gloves provide an effective hand protection during the intensive heat of hot-banding operation.

Heavy mitts are used to guard the hands of a brick mason very satisfactorily while he works on relining of furnace.

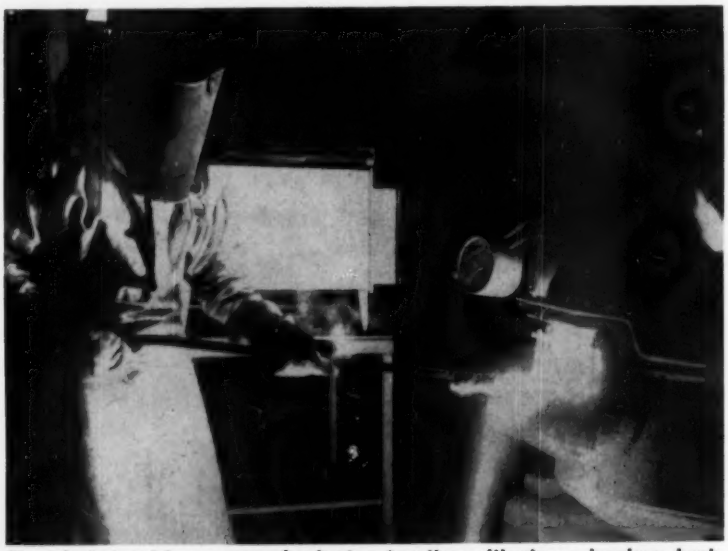
the furnace and ingot workers and rubber garments for the man working with acids, caustics or in excessive moisture.

The Air Force is credited with developing, during World War II, aluminized fabrics for use in crash-landing rescues and fire fighting generally. These same fabrics now are used by furnace workers. They find in them bodily comfort as well as bodily protection, since the metal coating tends to radiate rather than to absorb heat.

Today, fashions in safety clothing emphasize lighter weight material, to increase ease of movement and reduce fatigue. Thus, there are now treated cottons and other light fabrics that resist fire or corrosion or vapors or dust—and at the same time launder satisfactorily.

The number of lives—and the hours of time and the amounts of money—that have been saved through the scientific protection of steelworkers' bodies are incalculable. But they add up to an impressive record of an industry that, nearly 60 years later, continues to implement its enlightened slogan, now one of the oldest in American industry: "Safety First."

By courtesy of "Steelways," published by American Iron and Steel Institute.



Short jacket and long apron of asbestos, together with gloves, leggings, heat mask, give man removing slag from electrical furnace head-to-toe protection.

Worker is shielded from the heat of a blast furnace by a heavy woolen coat.

IRFAA Meeting

The Twelfth annual convention of the International Rescue and First Aid Association will be held at the Pick-Nicollet Hotel, Minneapolis, Minn., August 13, 14 and 15. The Friendship First Aid and Emergency Squad of Minneapolis and the Minnesota Rescue and First Aid Association will be co-hosts to the convention.

The convention program will feature panel discussions of new rescue and first aid techniques with all moderators and panelists highly qualified in the various emergency fields; addresses by widely-known experts; and the annual International First Aid Contest. First Vice President M. Loyd Fuller, Dallas, Texas, is the 1959 Convention Chairman. President Conrad H. Kreyling, River Edge, N. J. will preside at the business sessions.

The convention will be open to all persons interested in the rescue and first aid movement with the only requirement being that each register at the convention. All states and provinces, counties, municipalities, hospitals, civil defense and safety groups, veterans organizations and industries are invited to have representatives interested in rescue and first aid emergency activities attend the convention sessions.

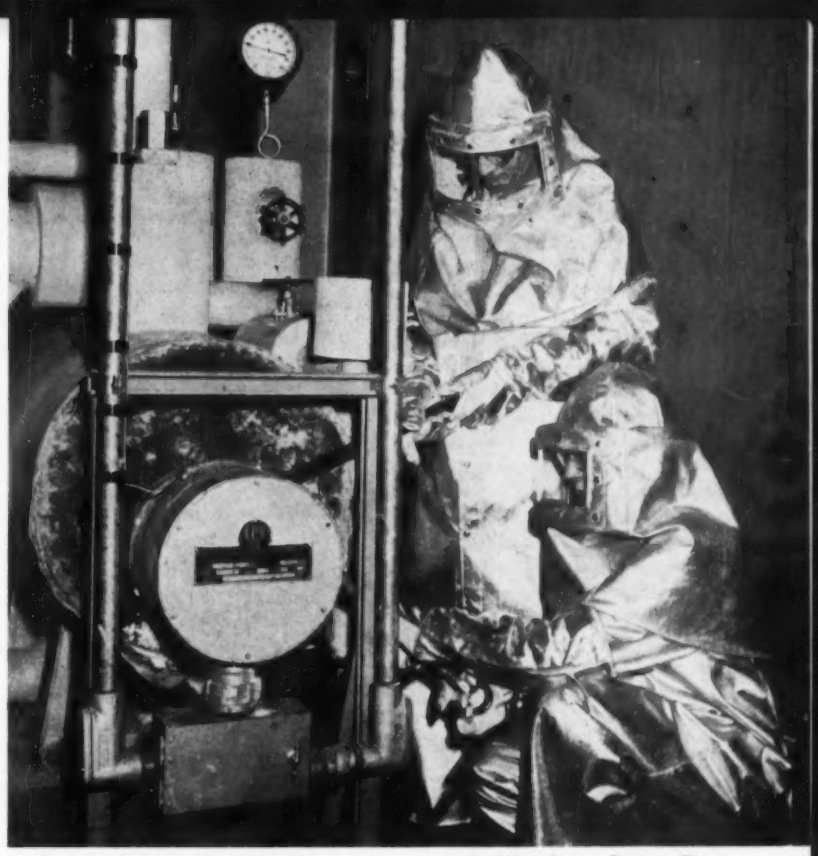
Joseph W. Schick, Chairman, Department of Rescue Training, OCDM Eastern Instructor Training Center, Brooklyn, New York will serve as Chairman of the First Aid Contest. Teams may enter the contest regardless of membership in the IRFAA but each member of a competing team must be registered at the convention. Teams must have a minimum of three persons, in line with operational practices on ambulance emergency operations.

Teams will have the option of using a fourth person but this will not affect the scoring. Trophies will be presented to the championship team and to the next four placing teams. Competition will be on the basis of three problems with casualty simulation to be used in at least one of the problems.

(Continued on page 13)

PROTECTION AGAINST HOT LIQUIDS

by **W. W. STORY, P.E., A.S.S.E.**
Safety & Fire Protection Supervisor
E. I. du Pont de Nemours & Co., Inc.
Circleville, Ohio



Picture shows pair of maintenance men at work tightening a flange. They are safeguarded by a complete liquid-and-heat resistant clothing outfit.

How du Pont meets fire and heat hazards in handling hot polymers.

At the E. I. du Pont de Nemours & Company plant in Circleville, Ohio, safety takes on some new aspects in the handling of polymeric materials. Polymeric materials, fairly common in the chemical field today, were almost unknown twenty, fifteen or even ten years ago. The product, "Mylar" polyester film, made since 1954 at the Circleville plant, was a laboratory curiosity only twelve short years ago.

The hazards inherent in the handling of polymers vary greatly with the polymer involved. At the Circleville plant, fire and heat are the principal hazards presented by the processes involved in the manufacturing of their plastic film. The toxicity of the primary chemicals, while it cannot be ignored, is not an outstanding hazard.

Solidified ditched polymer is handled by workers who wear face shields, sleeve protection, hot material gloves. All employees wear safety shoes where needed.

New Developments in Protective Clothing

Techniques developed for the safe handling of molten polymers require unusual qualities in the protective equipment used. The liquids involved vary in viscosity from water-thin to honey-thick fluids. Protective equipment must not only protect from heat but also from hot liquids soaking through to cause burns. Recently developed materials have provided the answer to some of the problems encountered.

Where a few years ago bulky heat protective clothing over rubber clothing, in turn over regular clothing, was the only means of

(Continued on page 50)

How to Smash Accidents

Safety engineers of the pulp and paper industry are whittling away at high accident frequency rates with impressive results.

While pulp and paper is still bracketed among the "high hazard" industries whose accident rate is higher than the rate for all industries, it is consistently improving its position. Statistics of the National Safety Council for 1957, show pulp and paper with an accident frequency rate of 7.15 compared to 6.27 for all of industry. As recently as 1953, the margin was appreciably greater: 9.54 for pulp and paper and 7.44 for industry as a whole.

In the area of accident severity, the record is more significant. Despite a higher frequency rate than all of industry, pulp and paper's severity rate is actually lower. Its 696 severity rate for 1957 compares favorably with the over-all industry rate of 740.

This means that while 740 days per million man-hours of exposure were lost and charged to all of industry, only 696 days were lost in the pulp and paper field. Yet, in 1953 when the rate for all of industry was 830, pulp and paper recorded a higher 890 rate.

Further reflecting the safety progress that has been made by the pulp and paper industry in recent years, is the fact that in the dozen years between 1941 and 1953 both frequency and severity rates were reduced almost 50 percent.

Additional Reductions

Additional reductions were noted in the years from 1953 to 1955, and 1955 to 1957. For the latter period, the frequency rate is recorded at 7.38. The severity rate is 729—less than the rate for all industries.

Pulp and paper's safety achievement, while paralleled to varied degrees by other segments of industry, is especially commendable in view of the many hazards inherent in processing procedures. A study of the necessary operations, from the time the logs arrive at the plant until the finished paper has been shipped, reveals some of the reasons for these relatively high averages.

In each step throughout the processes involved, these plants meet definite safety hazards. There are, however, precautionary measures which, if adhered to, can do much to lower both frequency and severity rates in all operations.

In the three chemical processes generally used today in making pulp, the sulphite, the sulphate, and the soda processes, there are many common problems. Some hazards met in using the sulphite process are not found in the other two; some in the sulphate and soda operations are not encountered in the sulphite. But these differences enter the picture in the later steps and arise, generally, from differences in chemical treatment. The materials handling problems are similar.

Logs arrive at the plant on board ships or in railroad cars. The first safety hazards are met in unloading the logs. They are usually lifted from the hold of a ship by a stiff leg and derrick boom. The jerking and shifting of the irregularly shaped logs in the sling makes them insecure. Adequate precautions require the services of a hatch tender who is responsible for all hoisting and lowering signals. All men involved in unloading should wear **protective hats and safety shoes.**

Pulpwood in railroad cars or trucks presents different problems. The wood is usually loaded parallel to the length of the car. Short lengths, four feet or less, should be secured while in transit by holding stakes and wire. To unload cars, the holding wires should be cut with **long handled cutters** so the workman can keep far enough away from the logs. **Safety goggles** should be worn at all times while cutting logs loose and removing stakes. Carloading **safety flags** and **clearance signs** should be placed on tracks and around the cars being

This article was prepared for SAFETY MAINTENANCE by the Industrial Safety Equipment Association, Inc., celebrating its 25th Anniversary this year.

to Pulp: SAFETY EQUIPMENT FOR THE PULP AND PAPER INDUSTRY

unloaded. If cars must be unloaded at night, adequate illumination should be available.

Most plants must store large quantities of pulpwood, as well as other raw materials, and liquid and bulk chemicals. Because of the nature of these materials, especially chemicals, certain hazards are found. Adequate safeguards against injury from falling materials, toxic gases, dusts and corrosive acids include **full facepiece gas masks, respirators, goggles, protective acid-proof clothing, and protective hats and safety shoes.** Smoking should be carefully controlled.

Pulp Operations

In the first processing step some very obvious hazards exist. The pulpwood must be sawed into easily manageable logs before debarking and chipping. Swing saws and slashers, used to reduce the logs to desired sizes, should have **adequate guards** in front of, or over, all tail sprockets, belts, pulley, and shafts, as well as in front of the saws. **Warning signs** should be placed where they can easily be seen.

Barking is a dangerous operation. Chips and wood particles frequently are sent flying through the air and men working on and around the barking machines should wear **goggles and face shields.** All machines, regardless of design, should have **wire screens** properly installed to protect workers and passersby from flying chips and particles. Moving parts of machinery need **mechanical guards.** On hand-feed machines, devices should be provided to prevent workers from getting their hands into machinery. **Power disconnecting devices and lockouts** will prevent workmen from being injured during maintenance work on machinery.

Chipping machines have hazards similar to those encountered at the saws and the barkers. **Machinery guards** for discs, screens and spouts, as well as **protective goggles and face shields** for personnel are necessary.

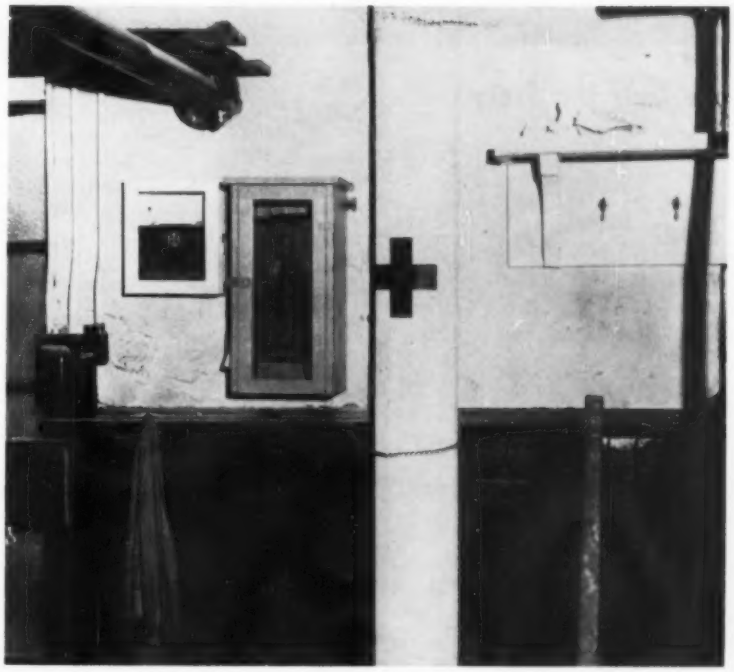
Chemical Hazards

Up to the point where the wood chips are digested, there is little difference in the three processes generally used to make pulp. From the digesters on, however, the nature of the chemicals used creates hazards which do differ.

The digesters in the sulphite process present a definite fire hazard. At least one **unobstructed exit** at each end of the digester room should be provided. **Full facepiece all-service gas masks** suitable for acid gases should be available in sufficient numbers to equip all personnel likely to be present in case of an emergency. These masks should be inspected at monthly intervals. Canisters should be replaced as recommended by the manufacturer.

The digester is filled with chips and acid by removing a cover at the top and **asbestos gloves** should be provided for removing the bolts on these hot digester heads. **A burn treatment kit** should be available.

The linings of the digester tanks should be inspected periodically. The inspector should be equipped with a **safety belt** which has a life line attended by an experienced employee outside the tank. **Fresh air** must be blown into the tank while anyone is inside. If lead burning inside the tank is necessary, **lead fume respirators or hose masks** with facepieces equipped with welding lenses should be used. In this operation the fresh air tube



Another Accident Checked

Only Half the Story

The picture shows a 40-pound sucker rod angled to indicate the direction it was falling just prior to impact with this hard hat. The aluminum safety hat was being worn at the time by a laborer at The Ohio Oil Company's Garland Field in Wyoming. The rod broke loose from its securement, fell 30 feet and struck the laborer on his hard hat as he was wrenching rods while standing on the floor of a pulling unit. The other half of the story? A young man who can thank the lucky stars he saw that he was wearing the safety hat when the blow toppled him. The hat undoubtedly protected him from a pierced skull and resultant fatal injury. The force gathered by the sucker rod in its fall was enough to make a ½-inch dent in the strong shell of the aluminum hat.

Picture by courtesy of Mine Safety Appliances Co.

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should be placed so the fumes will be blown away from workers.

In the sulphate and soda processes the cooking liquor in the digester is alkaline so there is no need for acid gas masks. Since there is no acid attack on the inside walls of the tank, the need for frequent inspection is eliminated, although the vessel should be inspected periodically, as all pressure vessels should.

The danger of caustic soda burns does exist in these operations so a copious supply of **running water, boric acid, or vinegar** should be maintained for treatment of such burns.

From digesters, the pulp goes through the essential processing steps; into the blow pit, then to the screens, the rifflers, the pulp thickeners, and the bleaching tanks. Normally, there are no serious hazards encountered between digesting and bleaching.

The hazards of bleaching today primarily involve the handling of liquid chlorine. Chlorine should be stored in an unoccupied, well ventilated room far enough away from operations so that any leakage could not affect workers. **Chlorine gas masks or self-contained breathing apparatus** should be available outside the room for emergency use. Preparation of the bleaching mixture should be done in a room apart from the general workroom, and all personnel working in or near this preparation room should be equipped with chlorine masks. All personnel should be trained in the elements of artificial respiration and **oxygen administration equipment** should be readily available. At least two exits, remote from one another, should be provided wherever chlorine is stored or processed. It is best to supply all personnel working in this type of operation with their personal masks.

When the pulp has been bleached, it runs through a wash tank, then to the machine chest where the paper making process is started. If it is not to be processed immediately, it is dried and stored.

In the manufacture of sulphite pulp, hazardous calcium bisulphite is used to cook the wood in the digesters.

Sulphur, melted and burned, unites with large quantities of air to form sulphur dioxide gas which is cooled and has all by-products removed. The gas is then forced up through towers, which contain wet limestone. The limestone and the gas form calcium bisulphite.

In the process several precautions must be taken. Handling the sulphur stirs up explosive sulphur dust. **Dust respirators** should be worn and **caution signs** should be displayed. In melting and burning the industrial acid gas, **masks** should be available where the sulphur is melted and burned. When the towers are loaded with limestone, workmen should wear **protective hats and safety shoes.**

Economic success in manufacturing pulp by the sulphate and soda processes depends, to a large ex-

tent, on the ability of the mill to recover for reuse the chemicals used in the digesting process. To do this, the various materials, other than pulp, which have been dissolved from the wood must be removed from the chemicals.

The liquor is removed from the digester tank, is thickened, then burned with added sodium sulphate to form a number of sodium salts. Good stack ventilation, above the furnace in which this burning is carried on, is essential. The fused alkali, removed from the furnace, runs into a dissolving tank. **Goggles** of a shade sufficient to protect workmen's eyes from the rays of the molten alkali, as well as **protective clothing** should be worn.

Pictures by courtesy of Industrial Safety Equipment Association, Inc.

IRFAA Meeting

(from page 8)

The contest will be conducted in general under American Red Cross rules; however, judging provisions will be made for teams having U. S. Bureau of Mines, Canadian Red Cross Society or the St. John Ambulance of Canada first aid training. Additional convention details may be obtained on request from the IRFAA Executive Office, 101 North Alfred Street, Alexandria, Virginia.

Early Plans for ISA Conference, Exhibit

Partly completed plans for the 14th Annual Conference and Exhibit of the Instrument Society of America have been announced by Henry C. Frost, president. The conference and exhibit—known as the "Instrumentation Show"—will be held in Chicago, September 20. The theme will be, "World Progress in Instrumentation." In line with this objective, arrangements are being made for from five to seven presentations by authorities from abroad, Mr. Frost disclosed.

During the week preceding the ISA conference, the International Federation of Automatic Control will be holding its General Assembly in Evanston, Ill., giving IFAC delegates an opportunity to attend the ISA meeting. Harold Chestnut of the General Electric Company, Schenectady, N. Y. is president of the international federation.

In addition to greater participation by overseas scientists, plans made thus far for the 1959 meeting include:

At least seven major program events emphasizing the use of computers—the so-called mechanical brains—for running industrial processes;

The equivalent of one and one-half days of sessions on photo instrumentation; and

Action to help alleviate the shortage of instrument men and other space-vehicle guidance, nuclear-energy controls and instrumentation-automation for a wide range of technicians, a major bottleneck to progress in instrumentation and automation. This will be attacked by a clinic on instrumentation fundamentals tailored to the training needs of technicians.

The exhibit will be held in the Chicago amphitheater. Technical sessions of the conference will be in downtown hotels.

Who Would Use This Equipment? Stumped? Turn the Page

Neither Martian nor a fire fighter. Night mist blowing aims at control of beetles spreading Dutch elm disease.

This apparent defiance of gravitation laws is managed without harm by this trained treeman aided by a safety rope.

Facing the wires for safety, this man moves carefully. Note that, in case of slip, rope will swing him clear of wires.

SAFETY IN TREES

by **ROSS J. McCAFFERTY,**
Safety Director
The Davey Tree Expert Company,
Kent, Ohio

Our accident prevention program is pretty much up in the air most of the time, simply because our men work in trees and may spend little time on the ground. That makes for special difficulties as does the fact that the fieldmen work in widely scattered crews.

Each tree being different in structure represents a different safety problem. Being able to identify different types of trees and getting to know their structural strengths and weaknesses may be almost a life or death matter. Because of this and because of the varied types of work to be handled, we conduct a constant program of education.

Contact and interest are kept up with the fieldmen through the Davey Bulletin, which is published monthly. A regular feature is "Another Hospital Candidate" cartoon that sells injury prevention with a smile.

Another regular feature is a series of "Actual Injury" and "Prevention of Injury" write-ups spread throughout the Bulletin. Each describes an actual accident and suggests preventive measures.

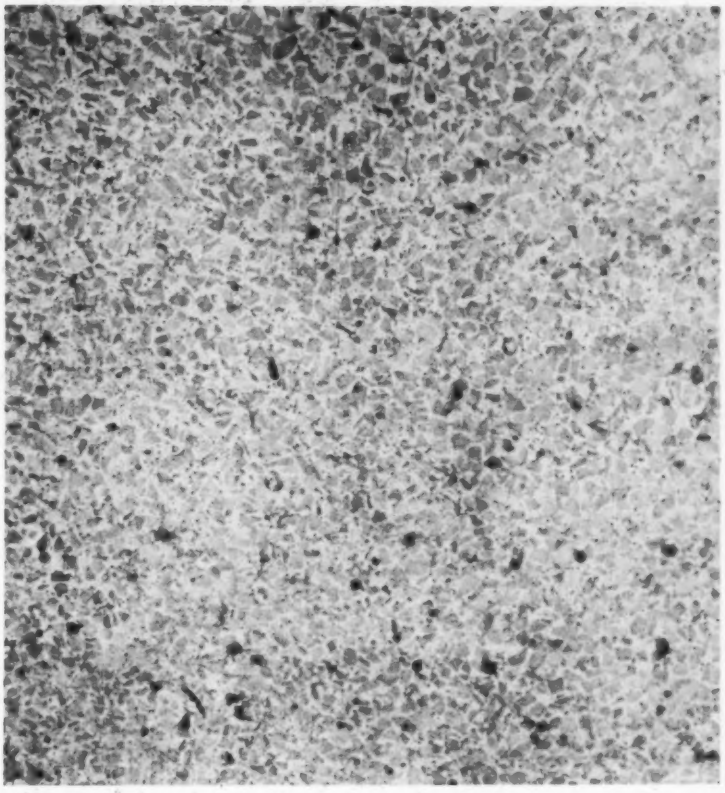
The program is rounded out by regular visits to crews by field supervisors and by two field safety supervisors whose specific and sole duty is to prevent injury to our men. The safety supervisors are on the move constantly, checking and inspecting field crews, condemning any equipment questionable from a safety angle, and watching for unsafe procedures to be eliminated.

Of course, the crew foremen are the key people. Being on the scene on an hour-by-hour, day-by-day basis, they have the primary opportunity and the primary responsibility for the prevention of injuries.

A tree-care crew uses a number of safety equipment items. The more important items include hard hats and caps, safety ropes, safety saddles and "Men Working" signs. While the use of safety equipment is stressed, principal emphasis is placed on the individual's alertness to his own safety and that of his fellow workers. After all, an alert worker is the best piece of safety equipment in the world.

By courtesy of the Industrial Commission of Ohio.

HOW POOR MAINTENANCE RUINS — magnesite



Of all the different kinds of floors, probably the least familiar is the magnesite or oxychloride floor. In the past few years magnesite has gained a certain degree of acceptance and it is estimated at least fifty million square feet are installed each year in Federal buildings and in other commercial and industrial applications. Here again, in oxychloride flooring, we find the criminal results of the harsh destructive alkaline cleaners. In this floor, the growth of alkaline crystals has actually blasted apart the marble chip. The black dots that are apparent over the entire surface of this oxychloride floor have appeared as the marble chips have been attacked through a chemical action. The marble chip has been broken or cracked apart and the resulting action has caused bacteria and dirt traps and voids that invite further and continuing destruction of the floor.

The fact that this is an unsealed floor, or that alkaline cleaners have eaten the seal out of the floor, has permitted the penetration of liquids into the floor.

Magnesite is classed as a semi-liquid floor. It is always "thirsty" because of the fact that the chloride in the floor continues to draw moisture from the air. The normal oxychloride floor can be actually bent many degrees without cracking. If too much moisture is used on the floor the chloride becomes more liquid through absorption of the scrubbing water and through the deep wetting agents of many so-called fast acting cleaners. When this occurs the chloride will actually funnel through to the bottom side of the floor leaving a brittle calcium honeycomb. Normally, the oxychloride floor will not crack unless it has been abused in cleaning. However, if excessive wetting action occurs and alkaline crystals form, the oxychloride floor, as it is usually laid over old wood floors, will crack and crumble.

The binder in a magnesite or oxychloride floor is magnesium oxychloride. This binder is formed in laying the floor, when magnesium oxide is combined with a strong solution of magnesium chloride; then the dry mix or fillers are added consisting of magnesia, aggregates, plasticizers and color pigments, all of which are properly proportioned and thoroughly mixed by machine on the job.

In 1943 the Oxychloride Cement Association was organized and set up specifications for laying of these floors. Today, reputable flooring contractors follow the thoroughly tested and approved specifications of the Association. Because of the wide variety of fillers which are added a thorough knowledge of the recommended treatment for this type floor should be acquired before original maintenance is begun. **A neutral cleaner should always be used in cleaning an oxychloride floor. Acids and alkaline cleaners should never be used. Acids will attack magnesite floors and cause pitting. In cases of extreme exposure, acid will cause a loss of strength. Harsh alkaline cleaners will cause a surface deterioration, as seen in the photograph. Avoid any cleaners which will form crystals for these crystals when formed in the pores of the floor may exert eventual pressure to cause a spalling or chipping of the surface.**

These pores in the surface of the oxychloride floor must be sealed off in the original floor treating.

(Continued on page 24)

Invisible microwaves, such as radar, can . . .
Ignite steel wool,
Set off photo-flash bulbs,
Ignite fuel vapors.
Do they affect the human body too?

This is an age of man-made scientific phenomena. Articles on atomic energy, satelites, supersonic aircraft, and electronic wonders seem to fill our newspapers and journals.

Whenever man does not understand the working of these scientific advances, he tends to place them in a supernatural category. In this atmosphere of miracles and mystery, reports and rumors of fearsome side effects on persons exposed to microwave radiation from radar beams have more than once found an interested audience. Then, like most rumors, it is passed on a little larger and blacker and soon all radar beams have become death rays. To eliminate this type of rumor, a basic understanding of microwave radiation is needed by personnel in the field of health protection.

Microwaves originate as electromagnetic impulses in a high frequency oscillator tube. The wave length of the impulses are relatively short, thus the term "micro." The waves are carried through a wave guide to a transmitting antenna which ejects them into space at the speed of light. When these waves strike an object which they cannot

Microwave Radiation Hazards

by **WILLIAM E. MORGAN**
Radiation Hygienist
Boeing Airplane Company

penetrate, the waves are reflected back to the antenna.

Microwaves are classed in a band of the electromagnetic spectrum just above the radio wave. This means that the microwave has a shorter wave length than the radio waves.

Energy from microwave radiation can be either absorbed or reflected by an object in the direct path of the microwave beam. The total amount absorbed or reflected depends on the material being bombarded and the frequency and power density of the bombarding microwave.

Airborne radar equipment employs several different wave lengths. S-band radiation—which contains longer wave lengths (10 cm), lower frequency (3000 megacycles), and high power density—is used for general search type work. The X- and C-bands are shorter (3 and 5 cm, respectively), with higher frequency (10,000 megacycles and 5,000 megacycles, respectively), and are used for weather radar and height finders which require less power density.

Some startling effects are produced by airborne radar. For example, **under some conditions** dry steel wool may be ignited. Photo flash bulbs have been set off at distances up to 350 feet. Ignition of this type of material is possible due to the fine wires being heated to a point of incandescence when excited by microwaves. Fuel vapors can also be ignited by a microwave beam if there are metal chips or wires in close proximity. An electric potential is built up between two metal particles and if a discharge takes place, the resulting arc ignites the fuel. This type of occurrence is uncommon, however, and normal precaution should eliminate the problem.

Effects on the Human Body

The biological effects of microwave radiation are to a great extent dependent on the frequency or wave length and the average field density (power). When microwaves are absorbed by matter, they produce localized heating. It is the nature of microwaves that the shorter X- and C-band wave lengths cause maximum heating effects at the skin level, where it is most easily felt and dissipated. The longer wave lengths of the S-band induce greater heating in the tissue below the skin. For the purpose of examining the effect of radiation, the body can be represented by a triple layer arrangement. Microwave radiation at frequencies of 3000 megacycles and above is usually reflected or absorbed by the outer layers of skin only and seldom penetrates the deeper layers. When radiation is absorbed, it causes heating of the tissue. The skin layer contains most of the body's nerve endings or sensory elements and when this layer absorbs the energy and overheats, warning is immediately sent to the brain. Of course, the brain tells the man he is getting too warm and to move; thus there is no overexposure.

Radiation in the range between 1000 and 3000 megacycles is capable of penetrating the skin and heating the fat layer. The amount of radiation absorbed in this layer is dependent on the thickness of skin and fat; this thickness varies with each individual.

Frequencies of less than 1000 megacycles are more serious than the high frequencies because they

penetrate both the skin and fat layers and heat the deep tissues of the body. This area of the body has less sensory elements and a possible overheating could occur before an adequate warning is sent to the brain.

The general consensus of medical investigators is that the primary hazard to the body from microwave is due to the heating effect. Injury does not occur instantaneously; however, chronic exposure to high levels may cause tissue damage.

Tests have been conducted on small fur-bearing animals to determine the effects of microwaves. The first test revealed potential health hazards. These tests were highly publicized and gained the attention of persons in all walks of life. The tests themselves do not necessarily apply to man for many important reasons. The small furry animal does not have efficient heat regulating mechanisms and it is quite easy to elevate its body temperature to a critical point. In the experiments, the animals were anesthetized, which eliminated their sense of feeling heat.

Man is a relatively large subject with a very efficient heat regulating system which can resist the effect of microwave heat more effectively. Also, man is usually working in open areas where it is easy to lose body heat to the surrounding cooler air. Another important factor is that the animals were exposed to a stationary beam, whereas most humans are exposed to beams from rotating antennas, which give the person exposed a chance to lose heat to the surrounding air between exposure intervals.

Direct tests and experiments were not possible with human beings, but complete physical examinations have been given to personnel occupationally exposed to microwave radiation. The history of personnel exposure varied from a few days to greater than 10 years. The results of these examinations showed no significant evidence of any temporary or permanent body changes or injury which could be attributed to microwave radiation. It is known, however, that powerful microwave emmissions do produce a heating effect on the body.

Control of Possible Hazards

Because of the potential danger of high powered radar, man has put into effect certain controls to minimize the hazards of radiation. At present, the main stem of these controls is a U. S. Air Force maximum permissible power density level of 10 mw/cm². The 10 mw/cm² is the line drawn between a hazardous and a non-hazardous microwave radiation area. Due to a lack of knowledge of the exact relationship between time of exposure, frequency of the wave, and the average power density, a large safety factor was placed in the maximum permissible power density.

The determination of free space power density at microwave frequencies can be accomplished with a minimum of equipment. Basically, the determination of power density involves probing the microwave field with a calibrated wave guide horn, half-wave dipoles or some other structure of known properties and measuring the received power flowing through a point at the end of the transmission line.*

In practice, an instrument made of four components, a calibrated wave guide horn, a detector mount, an attenuator, and a microwave power meter, is used. All the components are standard or stock devices and are easily obtained. By adjustment and calibration of the various component parts, a direct reading of power density in mw/cm² can be obtained. When probing a microwave field, the monitor performs the initial measurements at some practical distance from the radiation and gradually works in toward the source, thus safely guarding the man and the instrument. When measuring a high radiation field, the monitor is protected by a microwave-absorbing material: This synthetic material resembles pig hair matted together with a rubber-like material.

The controls of the microwave radiation hazard given in Table 1 are necessarily of a general nature because of the great variety of radar sets and their designs for

(Continued on page 63)

TABLE 1: Safety Rules For Microwave Radiations

1. Avoid any exposure to radio-frequency energy having a power density of 10 mw/cm² or greater. Areas accessible to transit personnel and having a power density equal to or greater than 10 mw/cm² will be posted with a caution sign and flashing light, and should not be occupied for any length of time.
2. Do not make detailed visual examination of any microwave radiator, reflector, wave guide opening, wave guide horn, or magnetron during periods of transmission.
3. Limit the number of personnel having access to areas immediately adjacent to test stands or benches containing equipment radiating energy of hazardous power. Only those required to perform specific tests should be present.
4. Use dummy loads, water loads, or other absorbent materials whenever possible to absorb the energy output of the transmitter while being operated or tested.
5. When this cannot be complied with, provide absorbent screening to isolate test stands from each other or from adjacent administrative areas which may be affected by the microwave radiation.

* From this measurement the power density can be calculated using the following formula:

$$Po = \frac{4\pi Pr}{\lambda^2 Gr}$$

where Po = power density in watts/cm²
Pr = received power in watts
Gr = absolute gain of receiving probe
λ = wave length in cm

The Search for Safer Solvents

Laboratories such as these, in a modern building devoted to research in biochemistry, play big role in industrial safety, particularly in solvent field.

Biochemistry Spells Safety In Industrial Facilities . . .

A quarter of a century ago, a young biochemist reported to the office of the president of a major chemical company.

He was a new employee—the first biochemist to be employed by that company—and he had a question: "What do I do?"

"Here's the company," the president replied, waving a hand at the plant buildings outside his office window. "See what you can find for a biochemist to do."

Neither of those men could have known it then, but that moment represented a big step forward in The Search For Safer Solvents—the field of industrial safety. Today industry knows very well why it needs biochemists. Without them, modern plants could be nightmares of hazards.

A major advantage of this solvent as an industrial cleanser is versatility. It is used readily in open bucket (above) or, with respiratory guard, in spray gun.

Any number of examples of biochemistry's value in the field of safety are available. One that applies particularly well to industry is in the field of solvents.

Solvents, after all, find hundreds of industrial uses as degreasers and general cleaners, as well as in various other maintenance and manufacturing functions. Their use is so universal, in fact, that they are often taken for granted—until something goes wrong.

A few years ago industry became unpleasantly aware of the consequences when carbon tetrachloride is used improperly as an industrial cleanser. The result: A number of cases of accidental poisoning and considerable unfavorable publicity.

These mishaps with carbon tet did not indict all chlorinated hydrocarbons as unsafe, since all solvents in this group do not present the same toxic hazards. Also, nothing happened to change the toxicity of carbon tet or the fact that it could be used safely. What was demonstrated was that is was not being used properly at times, and that as a result, the piper was extracting payment.

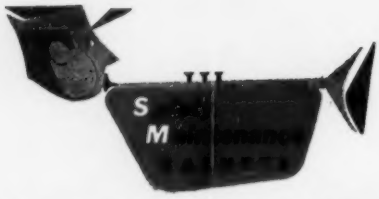
Biochemists point out that all materials are toxic—and potentially hazardous. The hazards any material presents depend on the way it is used. For instance, if a person eats enough chocolate candy, he can become just as ill as he would if he nibbled at a commonly accepted form of poison.

These facts pointed up a job ahead for biochemists: they were to find an effective non-flammable solvent that could be handled with fewer precautions than carbon tet requires during various industrial applications.

Research Produced Answer

The Dow Chemical Company's Biochemistry Research Laboratory came up with the answer after years of research and evaluation. Biochemists in that department discovered that a colorless, pleasant smelling liquid named 1,1,1 trichloroethane has a low toxicity among its other qualities. They set to work promoting its development, a job that involved research efforts by other groups in search of a corrosion inhibitor.

Interest continued to increase as development continued. Researchers found that 1,1,1 trichloroethane



A SAFETY IDEA

Plastic Gangway Lines

After more than six months of actual shipboard testing, Gulf Oil Corporation's Marine Department is installing new nylon-reinforced plastic gangway lines with manila cores as standard throughout its entire American Flag fleet. The line material is of the ½-in. size.

Increased safety was given by Gulf officials as the main reason for the change. The plastic lines have non-skid grip, won't absorb oil or water, and prevent hand splinters. The bright nylon reinforcing cord reflects any nearby illumination and is easy to see in dimly lighted areas.

Maintenance is improved, too. Dirt or grease can be wiped off, and the line is impervious to rot, aging, and weather. Because the plastic keeps its uniform shipshape appearance, lines are always neat and clean.

Picture by courtesy of American Hard Rubber Co. Division of Amerace Corporation.

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is an excellent cold cleanser for most common grease and oil contaminants, that it presented no practical fire hazard, and that its corrosion rate—with an inhibitor added—is low.

Even better news to biochemists came from continuing toxicity tests. They found that as far as the eyes, the skin, and swallowing were concerned, the material is less hazardous than many other solvents. It can be used without difficulty in an open bucket to dip-clean greasy tools, or, with suitable respiratory protection, it can be used in a spray gun to clean massive machinery. For many uses, the safety emphasis was changed from mass protective measures that could stop or slow work over a wide area to individualized protection that left nearby work areas completely unhampered while cleaning work with the solvent was under way.

Findings Encouraging

Recently, still another series of experiments was undertaken by biochemists to supplement previous data and to provide a more adequate basis for evaluating the hazards involved in the use of inhibited 1,1,1 trichloroethane. Their findings, documented in the October, 1958, American Industrial Hygiene Association Journal, were again encouraging.

These experiments reconfirmed that the new solvent presents a minimum hazard to the eyes and skin, and that its oral toxicity is so low that there is little probability that lethal amounts would be swallowed accidentally. As for its vapors, it was found to have a weak anesthetic action, but with little capacity to cause organic injury.

Practical industrial experience gained over four years of widespread use of the solvent has provided still more substantiation to the findings of the research of years past. For example, despite its wide use as a bucket solvent, only a few minor cases of skin irritation have been reported. There have been no cases of eye irritation reported, and no injuries due to inhalation are known to have occurred when the solvent * has been used as recommended.

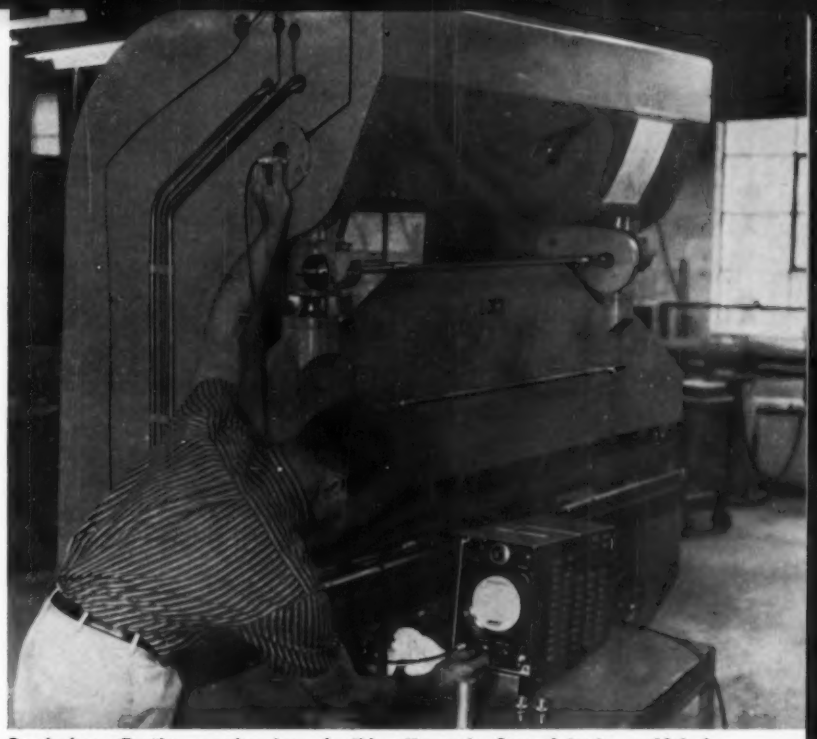
Support Conclusion

Together, these results do more than present an example of biochemical research results. They also add up to proof that that company president of a quarter of a century ago was right when he concluded that biochemistry has a job to perform in industry.

* A source for further information about the solvent can be obtained upon inquiry to the editor.

Pictures by courtesy of Dow Chemical Co.

DETECT DEFECTS WITH SOUND



Rendering effective service here is this ultrasonic flaw detector, which is being employed to test the shaft of a power press brake for imperfections.

One post-war development that has tremendous potential in both safety and maintenance is the use of ultrasonics to detect flaws in materials and equipment. The most striking advantage of ultrasonic detectors is that they permit the non-destructive testing of equipment. Of almost equal importance is their versatility; they can detect flaws or measure the thickness of metals, rubber or plastics, and even be used on animals and human beings.

TABLE I Typical Applications for Ultrasonic Flaw Detector

Industry	Material or Equipment	Defects
Basic Metals	Steel, aluminum, iron, magnesium, etc.	Porosity, inclusions, center pipe
Metal Fabricators	Plate, sheet, pipe, tubing, forgings, extrusions, die blocks, castings	Laminations, seams, inclusions, bursts, flaking, porosity
Aircrart	Aircraft engine components, propellers, airframe components, landing gear	Fatigue cracks, internal flaws in material received
Automotive	Body panel sheets, engine and transmission parts	Laminations, cracks
Rubber	Tires	Ply separations
Plastics	Plastics and ceramics	Porosity, inclusions, cracks

(Continued on the next page)

Ultrasonic detectors have now reached the stage where they are practical for a wide variety of applications. The accompanying Table I shows some of the industries in which a recently perfected portable model can be used. This particular model offers simplified operation, convenient size and weight for field testing, and flexibility for laboratory requirements. The bright oscilliscope trace is visible under normal shop lighting conditions.

The instrument can be used both for contact or immersion work, and should prove a particularly useful tool for field inspection. Equipped with handles which fold up and over the cabinet, the unit is easily carried by one man.*

Both flaw detection and thickness measurement are possible with instruments using the pulse-echo detection principle. Ultrasonic pulses are sent intermittently into the material under test and, together with the returning "echo", are displayed on a cathode-ray tube. Variations in the normal pattern indicate a flaw or discontinuity.

A major advantage of the newly designed pulse-echo equipment is its broad-band amplifier, which permits a continuous range of test

* A source for further information about the instrument can be obtained on inquiry to the Editor.

Table I—(Continued from page 21)

Industry	Material or Equipment	Defects
	Fiberglass reinforced laminates	Delamination
Railroads	Axles and crankshafts in engines and rolling stock	Fatigue cracks
	Track and wheels	Cracks
Metal Stamping	Sheet stock	Laminations, inclusions
	Crankshafts, punch press	Fatigue cracks
Electric Power	Turbines and generators	Internal cracks and flaws
	Piping	Seams
	Pressure vessels, penstocks	Weld defects
Chemical and Refineries	Compressors	Connecting rods
	Vessels and piping	Seams, laminations, weld defects
Mining and Quarrying	Hoist and crusher shafts	Fatigue cracks
Marine	Hull plate	Laminations, weld flaws
	Propellers	Cracks, porosity
	Shafts	Cracks
Metallurgy	All metals	Physical constants, grain size
Medical	Cancer diagnosis, finding foreign bodies in the eye, detached retina determination	
Agriculture	Depth of fat and lean on hogs and cattle	

Undergoing a demonstration in the above picture is the broad band amplifier system of the ultrasonic detector, a highly competent flaw detection tool.

frequencies. Formerly, instruments offered a limited number of specific frequencies, and required changing the transducer, changing the frequency, and retuning the instrument. The new method, on the other hand, permits automatic adjustment to any transducer within the operating range of 0.4 to 10 mc. The transducers are equipped with quick disconnects, so that changing frequency requires only five seconds.

A distance marker, which can be shifted laterally, has also been incorporated into the instrument. Instead of a square marker, the instrument shows a pyramid, which makes weak signals, or those at critical points, much easier to detect. The pyramid marker is especially useful for determining flaw location, when ultrasonic pulses are beamed into the material at an angle.

An optional plug-in flaw alarm will activate bells, relays, or other devices to signal that allowable test limits have been exceeded.

Design Details

An infinite choice of frequency, between 0.4 and 10 mc, is available, depending on the transducer selected. Ceramic Type Z-S transducers for contact work, or Type Z-T for immersion applications, are normally used.

The pulse delivers high-frequency bursts of electrical energy, at a rate adjustable from 100 to 600 cps, based on desired scanning speed and trace brightness. The broad-band receiver amplifies returning echoes at all frequencies within the instrument range. Calibrated fine and coarse gain adjustments combine to provide an amplification range of more than 25,000 to 1.

At 2.25 or 5 mc, with contact or immersion transducer, an aluminum test block with $\frac{1}{64}$-in. diameter flat bottom hole will cause a full scale (3-in. high) signal. Flaws $\frac{1}{8}$ in. or more away from the surface are readily detectable.

Read-out on the flat-faced cathode ray tube shows an equivalent depth of 1 in. to 40 ft in steel across the 4-in. effective sweep of the tube. Horizontal and vertical

(Continued on page 50)

Boiler cleaning? It's easy with new vacuum technique. A long tube at the end of steel drum is rotated in the boiler flue. Wire brush loosens soot, sucton pulls it into drum.

Boiler Soot Gets the Vacuum Treatment

The existence of a dirty boiler in one of the most modern insurance company buildings in the world was an unnerving thought. In fact it was a thought which led the management of Utica Mutual Insurance Company to look carefully into the problems of boiler maintenance and care.

The basic fact was this: the Utica Mutual office building was not built to accommodate obsolete cleaning techniques. Less than 6 years old, the building stands as one of the most modern in the country, designed along clean, straight lines of glass and marble. It houses 1000 employees and the main operating floor space encompasses 75,000 sq. feet. Completely air-conditioned, the building is precision temperature controlled in summer and winter.

Heat is supplied by three horizontal tube low pressure boilers. The boilers are used exclusively for steam heat, with a boiler capacity of 15,000 BTU per hour. One boiler is on a stand-by basis at all times.

At first these boilers were cleaned by hand. This proved highly unsatisfactory in terms of time and cleanliness. It was almost impossible to remove soot adequately by hand. When cleaning, a fine, powdery soot was agitated and cast into the air, settling throughout the room.

Soot created a personnel problem as well as one of cleanliness. It was difficult to obtain dependable people to perform this type of work.

Maintenance people have sought a solution to the problem of soot for many years. It was of especial concern to some insurance people because of health and safety factors.

It was brought out in tests conducted at the Veterans Administration Hospital in Houston, Texas that soot affected health. These tests indicated that soot may have

been a contributing factor in the incidence of a very serious lung cancer called pulmonary emphysema. Dr. Charles Oderr, of the Veterans Hospital, conducted tests on the lungs of 125 deceased patients. Of these patients, 58 percent had had emphysema. Dr. Oderr said that soot deposits were found in the lungs of most of the emphysema victims and that persons working around dust or soot appeared most likely to be affected.

As to the safety factor, it is considered that accumulations of soot are among the causes of boiler explosions, a considerable wintertime hazard.

Also there is the highly practical problem of boiler efficiency. Soot is ruinous to boiler efficiency. According to an expert on power plant efficiency, Jacques Abady, soot is five times as resistant to heat as asbestos.

The decision was made to seek out a more efficient boiler cleaning technique, provided there was one on the market. A study of the market lead the company to a new technique based on the vacuum principle, developed by one of the leading manufacturers of quality floor machines and vacuum cleaning equipment.

The new system works with surprising simplicity, involving the use of an industrial vacuum and special attachments. At the heart of the system is a large vacuum head unit which is attachable to drum containers of varying sizes by a drum seal. A special asbestos-lined steel hose leads from the vacuum head unit. A boiler tube cleaning unit is attached to the steel hose by a pin lock. This cleaning unit consists of a specially formed tube, which fits the specific flue size, at the end of which is a wire brush. The tube and attachment are inserted into the boiler flue and rotated by the operator. The vacuum does the rest.

The soot is loosened by the action of the brush and suction brings it back through the tube and hose into the drum. Thus the soot is taken from the boiler tubes and never allowed to enter the atmosphere of the boiler room.

This is the system that the insurance company finds so highly satisfactory at the present time. They find it more efficient and easier for the men to perform. The problem of soot is virtually solved and, as a result, the building has a boiler room as spotless as other areas.

Says Herb Evans, maintenance man: "It's a tremendous improvement over the old methods."

Pictures by courtesy of The Kent Co.

(For details, use Key # G-3 on card on page 1)

Poor Maintenance
(from page 15)

This eliminates the dirt and moisture traps that cause maintenance problems. This seal treatment then leaves the surface of the floor smooth and protected against moisture, soil and stains. Sealing will also prevent dusting as the floor ages.

Above all, excessive water must not come in contact with an oxychloride floor for extended periods. Water that penetrates the surface exerts a leeching action and ultimately causes deterioration.

The August issue will feature an article on the ruinous effects of poor maintenance on quarry tile.

Material by courtesy of Hillyard Chemical Co.

SPOT ACCIDENTS IN ADVANCE PART 3

The material for this article, and for the two previous installments in the May and June issues of "Safety Maintenance," is from an analysis of injury and accident causes in the boilershop-products industry, prepared by Frank S. McElroy and George R. McCormack of the Division of Industrial Hazards, Bureau of Labor Statistics, U. S. Dept. of Labor.

In Part 1 of the article, it was shown that three-fourths of all the reported injuries involved handling materials, using handtools, and operating machines. It also indicated the parts of the body most frequently injured, the nature of the injuries, and the objects that caused the injuries.

Part 2 made clear that in the boilershop-products industry the types of accidents that should receive priority in terms of preventive efforts are those where employees are struck by moving objects; caught in, under, or between objects; and falls.

How to Find the Causes of Accidents

Ability to recognize the conditions or circumstances that are likely to lead to accidents is a prerequisite to effective accident prevention. Every accident results from a particular combination of conditions and circumstances. Any time that a similar combination of conditions and circumstances is permitted to exist, a similar accident is likely to happen. Fortunately, the accident preventionist can avoid a repitition of the accident by eliminating any one of the factors that together produced the accident.

In **accident investigation,** we determine and record all the conditions and circumstances associated with the accident. In **accident analysis,** however, we sift through these facts gathered from the investigation and determine which of the conditions and circumstances directly contributed to the occurrence of the accident. In an analysis of accidents for a whole industry, such as this, the purpose is to see if accident-causing factors tend to concentrate in patterns. A concentration of the factors is a signal for preventive efforts to eliminate that particular accident cause; and the degree of concentration may also indicate the priority of preventive efforts.

There are limitations to accident analysis. It can furnish clues as to the areas requiring accident-prevention activities, but it cannot show how to eliminate the accident factors. It must be remembered too that the two general categories of accident factors, hazardous working conditions and unsafe acts, are not necessarily exclusive. Both may and are likely to be present. In other words, the purpose should not be to find the single major cause of each accident. Instead, the purpose is to determine independently for each accident (1) whether there was a hazardous condition contributing to it, and/or (2) whether the accident was directly associated with an unsafe act.

In this study, many details were lacking from some of the accidents included in the survey; but it might be noted that hazardous working conditions were identified in at least 89 percent of the accidents studied and unsafe acts were found in at least 85 percent of the cases. For the rest, the causes could not be determined.

The correction of hazardous working conditions usually is entirely within the powers of management and can be accomplished by management action. The avoidance of unsafe acts, on the other hand, requires cooperation and understanding by both management and workers. Management should take the lead by providing safety-minded supervision and by making sure that all workers know the hazards of their operations and the means of overcoming those hazards.

Hazardous Working Conditions

Hazardous working conditions include not only the adverse physical conditions of the working environment, but also the inadequately planned or controlled methods and procedures applied in the work activities. The latter, as a matter of fact, was found to be the most prolific cause of accidents in the boilershop-products industry. In broad categories, the analysis indicated that the most common sources of accidents in the industry were: (1) Hazardous procedures; (2) placement hazards; (3) inadequate guarding; and (4) defective agencies. (See Chart 5.)

HAZARDOUS OPERATIONS AND PROCEDURES: These hazards arise primarily from manage-

ment's failure in two important areas of supervisory responsibility—

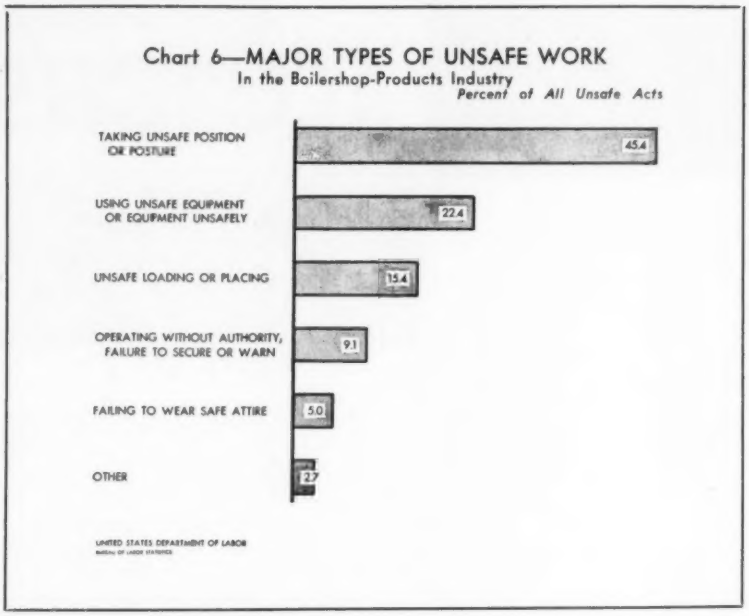
(1) to plan for safety in the operations and to provide proper equipment and facilities for the jobs to be done; and

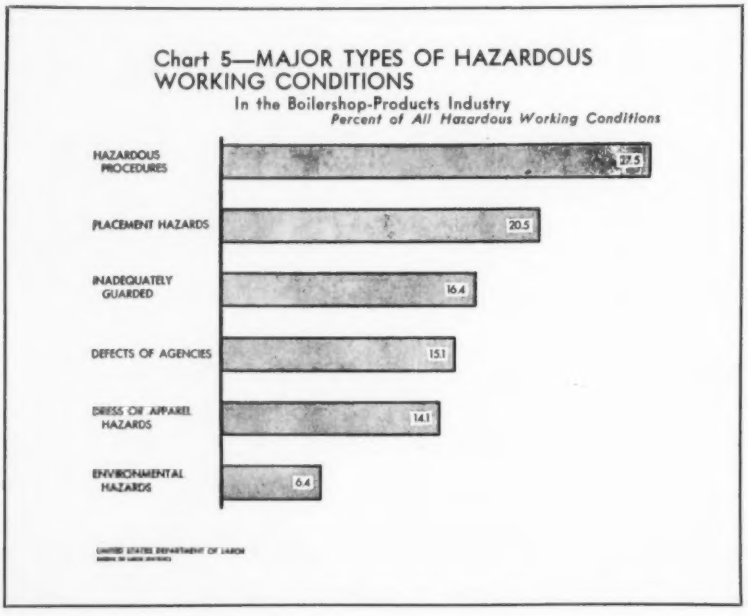
(2) to provide adequate supervision to insure safe performance of the designated activities.

Inadequate provision for safe in-plant movement of heavy, bulky, and awkward materials, mostly metal stock and fabricated assemblies, was the most common accident cause in this general category. Obviously, no single corrective measure will resolve all of the problems, but it is apparent that materials movement was frequently entirely unplanned and undertaken haphazardly by untrained workers. Materials which might be moved safely by mechanical equipment were too often moved by hand and without an adequate crew to divide and control the load. Overexertion, resulting in strains, sprains, hernias, etc., was the most common proof of these hazardous procedures; but there were also many instances in which workers were struck by objects which they were moving by hand and which went out of control during the movement. In other instances, workers were squeezed or crushed between the objects they were moving and fixed objects. These hazards were relatively much more common in small plants than in large ones.

The lack of adequate scaffolds, platforms, or other stable working surfaces for work at elevations was the basic cause for many falls from makeshift supports employed in work on large fabrications.

Many of the accidents arising in the movement of materials by crane resulted from hazardous procedures which adequate supervision might have prevented. Among these procedures was the practice of guiding sling loads by hand.





PLACEMENT HAZARDS: Improper placement of materials and equipment caused about 1 in every 5 of the accidents studied —i.e., improperly placed in respect to the position occupied; or improperly piled or inadequately secured in respect to stability in their position. Improper placement frequently constituted a violation of good housekeeping practices which commonly resulted in a tripping or bumping hazard in an aisle or work area. Metal stock, lumber, handtools, and small fabricated assemblies were the objects most commonly misplaced.

The hazard of improperly piled materials was encountered more frequently in the general working areas than in designated materials storage areas. Generally, they were supplies or completed small fabrications accumulated at the workspace in unstable piles.

Accidents of the "struck by" variety were also the result of inadequately secured materials. Other cases involved materials which became dislodged when they were moved on plant vehicles.

INADEQUATE GUARDING: The provision of physical barriers to prevent persons from coming into contact with moving machinery, equipment, or materials; to

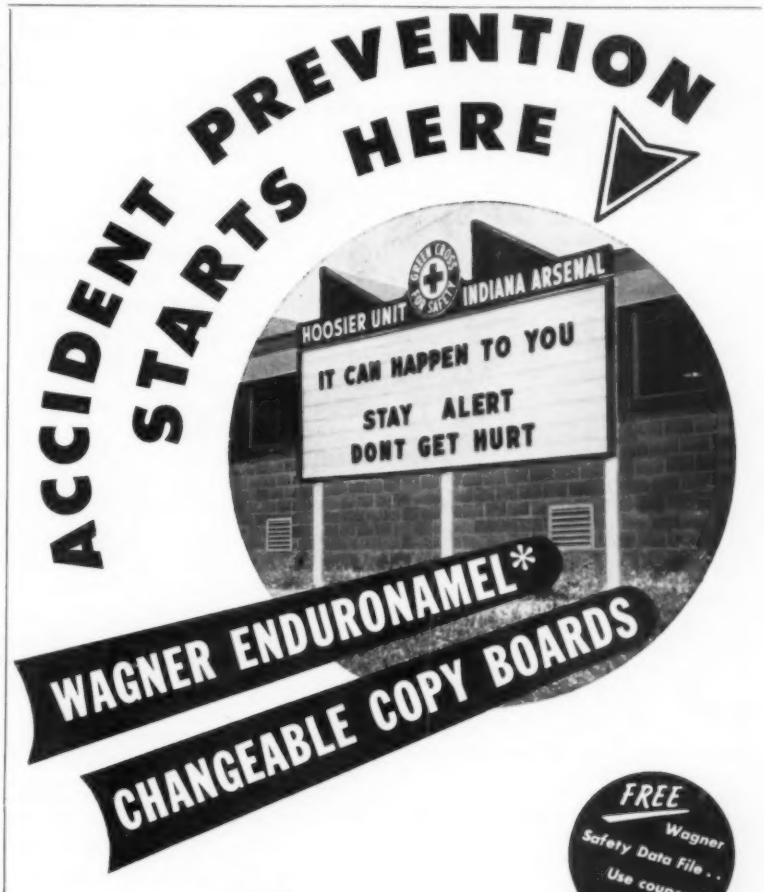
prevent falls from elevations; and to avoid contact with potentially dangerous objects or substances in the working environment constitutes the foundation of accident prevention. The need for such devices has become axiomatic among safety engineers and the principles of guarding have been incorporated into most safety standards and safety manuals, frequently with great technical detail. Guarding requirements for many kinds of machines and equipment, and for some industrial processes, have also been enacted into law in many States.

Despite the emphasis placed upon guarding as a basic element in accident prevention over many years and the general acceptance of these principles throughout the safety movement, there are still wide areas of industrial activity in which these principles are ignored or ineffectually applied. Most commonly the reasons cited for not providing, or not enforcing, the use of adequate guards are: the high cost of installing and maintaining guards; the reduction in efficiency (i.e., production rates) arising from the use of guards; resistance on the part of employees to the use of guards based upon assumed inconvenience imposed by the presence of a guard; and a lack of conviction that there is a real need for guards.

The answers to the first two of these objections lie in the field of engineering and design. For most equipment, simple guards, which not only provide protection but also increase efficiency, can be and have been designed. The answers to the last two objections lie in the record of the accidents which have occurred in the absence of adequate guarding and which might have been avoided if adequate guards had been in use.

More than 16 percent of the accidents reported in this survey were directly attributable to inadequate guarding. This fact alone is an impressive indication that improvement in guarding practices should have high priority in the safety programs of the boilershop-products industry. Even more significant and reflecting the resulting human suffering, this group of accidents produced 40 percent of the reported deaths and 43 percent of the permanent disabilities recorded in the study. From the viewpoint of costs, this group of cases was responsible for 34 percent of the total volume of days lost or charged to all injuries in the study. More specifically, the average time charge per case for the "inadequate guarding" group was 188 days, more than double the average of 86 days for all cases in the survey. Even in respect to temporary disabilities, the comparison is unfavorable to this group. The average recovery time for temporary injuries resulting from inadequate guarding was 21 days, compared with 16 days for all temporary injuries.

The range of inadequately guarded equipment was wide. Most prominent was the lack of adequate guarding at the point of operation of fixed machines such as rolls, presses, grinding machines, saws, shears, and drills. In many instances, however, powered hand-tools, particularly grinders, were the unguarded agencies.



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The problem of providing adequate guards is not, however, limited to machines or powered equipment. Many accidents resulted from the absence of safety hooks or safety clamps on hoisting apparatus. The use of such protective devices might have avoided the dropping of crane loads which injured many persons. Similarly, wider use of safety shoes or anchors on ladders might have prevented a number of falls. Guard rails on scaffolds, platforms, and other elevated working surfaces might also have prevented some serious falls, and the provision of toe boards on elevated working surfaces might have prevented materials from falling on workers below.

DEFECTS OF AGENCIES: The elimination of accidents resulting from defective material and equipment does not ordinarily require a high degree of engineering skill—but it does require continuing attention. These hazards frequently develop gradually and tend to merge into the environmental background. They become accepted characteristics of the workplace and their potential as accident producers is overlooked because "that's the way things are." Control of these insidious hazards rests primarily upon frequent inspection of all premises, materials, and equipment to detect defective items, and upon provisions for the prompt repair or removal of the defective items from service. In the main, these hazards tend to be obvious when a definite effort is made to find them.

More than 15 percent of the accidents analyzed in this survey were directly attributable to defective agencies and most, if not all, of these defective conditions could readily have been detected and corrected before they resulted in accidents. Defective floors—i.e., slippery from wear or from spilled oil or other materials, or irregular from wear—were prominent in this group of accident sources. Worn, cracked, sprung, mushroomed, or otherwise defective handtools also contributed to a substantial number of accidents. Here again the defects generally could have been recognized as hazards under an adequate inspection and replacement system.

Adequate maintenance for machinery is not only a safety measure—it is an economic and operating necessity. Evidence of failure to recognize this lies in the number of cases in which machine parts broke or came loose from their supports during operation of the equipment and struck the operators or other persons nearby.

Burred edges on the metal plates and stock being fabricated were another very common hazard in this group. The resulting cuts and lacerations to fingers and hands generally were not serious, but the possibility of severe infection is always present.

An interesting sidelight of the analysis, for which no reason is apparent, is that accidents ascribed to defective agencies were relatively more common in large boiler-shop-products plants than in small ones.

MISCELLANEOUS: The obvious conclusion that concentration on the elimination of the hazards already discussed will result in a highly favorable reduction in accident volume does not mean that other kinds of hazards should be ignored. Some of the less frequently encountered hazards which demand attention are important in terms of potentially serious injuries. One of the more important hazards which was found in this group was that of congestion in the working areas. More specifically, inadequate clearance for materials which were being moved was directly responsible for two of the fatalities reported in the survey.

The need for more adequate provision of personal protective equipment throughout the industry is also apparent; for example, the record definitely indicates the need for a stronger goggle program for operations involving eye hazards. Expanded provisions for the use of gloves, safety shoes, and other protective devices, such as leather aprons, are needed for the safer performance of many of the industry's activities.

Unsafe Acts

For the purposes of this study, an unsafe act was defined as the "violation of a commonly accepted safe procedure which directly permitted or occasioned the occurrence of the injury-producing accident." By this definition, no action could be considered unsafe unless there was an alternative, safe procedure. For example, an employee who was injured by contact with a circular saw for which no guard was available was not considered as committing an unsafe act because he had no alternative but to use the unguarded saw. On the other hand, a worker who was injured after removing the guard, committed an unsafe act because he had the alternative of using the saw with the guard.

The definition, however, does not imply that the worker must necessarily know the alternative safe procedure. Although some workers obviously committed unsafe acts through choice, it was apparent that many workers simply did not know the safe method of performing their duties. The correction of unsafe acts, therefore, requires a twofold effort—education and enforcement. First, workers must be thoroughly trained in the safe performance of their duties; and second, management must provide adequate supervision to assure that the safe procedures are used.

The analysis indicated that two general kinds of unsafe acts are extremely common in the boiler-shop-products industry—taking unsafe positions or postures; and using unsafe equipment or using equipment unsafely. Somewhat less common, but nevertheless important, accident causes are unsafe loading or placing; and operating without authority or failing to secure the equipment against unexpected movement or failing to adequately warn others of the activities being performed in the area. (See Chart 6.)

TAKING UNSAFE POSITIONS OR POSTURES: In the majority of these cases, the specific unsafe act was either inattention to footing or inattention to surroundings. Inattention to footing was the more common fault, but the resulting injuries were generally less severe than those arising from inattention to surroundings.

Basically, these unsafe acts con-

(Continued on page 58)

Edited by HENRY M. GROSMAN
Counselor at Law, Newark, N. J.

MEMBER . . . . . .
Master Superior Court, New Jersey American Bar Ass'n, New Jersey Bar Ass'n, Chairman, Committee on Workmen's Compensation, New Jersey Bar Association National Federation Insurance Counsel Past Commander, American Legion, Post 10, ... Newark, N. J.

VOLUNTARY CONSTRUCTION WORK—Employer-Employee Relationship

The widow of a deceased carpenter was entitled to receive death benefits for her husband who died of injuries sustained while voluntarily aiding in the construction of a new church. The minister announced that volunteer labor could be applied toward the payment of tithes (ten percent of the regular salary) which the deceased gave to the church. The deceased offered his services almost daily and worked between two to four hours per day for approximately six months prior to the accident. The minister acted as general contractor and had the right to direct the efforts of the volunteer labor force and to discharge anyone as he saw fit. The minister had taken out a compensation policy to cover the volunteer carpentry labor. He contended that since the deceased volunteered his services to the church and received no wages, the relation of employer-employee did not exist as required under the act and therefore the board did not have jurisdiction to make an award.

The court decided that the deceased performed services for his church and that they were valuable since these services could be applied toward the payments of the tithes. His work was not casual since he worked steadily at it for six months. The building of the new church could be considered in the regular course of business since it was necessary to accomodate the expanding congregation. The work was done upon request and under authorization. The court concluded that when an employer has the power to remove and discharge an employee the relationship of employer-employee exists. Judgment affirmed.

Schreckengost v. Gospel Tabernacle; Pennsylvania Superior Court. No. 264. March 18, 1959.

BACK INJURY—Course of Employment —Employer's Premises

The commission had denied compensation to an employee who sustained a back injury when she slipped and fell on a public sidewalk immediately in front and within six feet of the employees' entrance to the employer's factory as she was going to work in the morning. The court affirmed the decision. Since at the time of the accident the employee had not yet entered on the premises owned or controlled by the employer, and

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had not checked in or commenced her work, the injury did not arise out of and in the course of her employment. The court held that injuries suffered by employees on the way to work are not compensable, unless the duties of the employment require the employee to perform his work away from the employer's premises, which was not the case here. Affirmed.

Markley v. Richmond Glove Corp.; Indiana Appellate Court, First Division. No. 19, 267. Mar. 4, 1959.

HAND DISEASE—Failure to Prove Occurrence of Accident

The claimant was denied compensation for a hand ailment for failure to prove the occurrence of an accident which could have caused her disability. She noticed that her fingers and hands became numb and swollen and were painful, and that her contact with cold meats caused these symptoms to appear and caused her disability. However, there was no evidence that the claimant had sustained an accidental injury of any type. **Award reversed** and matter remitted.

Hoare v. Great Atlantic & Pacific Tea Co.; New York Supreme Court, Appellate Division, Third Judicial Department. No. 1085. March 11, 1959.

LEG INJURY—Voluntary Reimbursements by Employer—Justification For Continuance of Payments

The court denied the claimant further voluntary reimbursements from his employer and its carrier. He had suffered a ruptured tendon in his left leg. In order to aid his rehabilitation the employer had voluntarily reimbursed him for gasoline used in the claimant's car in travelling to his employer's place of business. They also had reimbursed him for whiskey which he was taking as a stimulant and vasodilator. When the employer stopped these reimbursements, the employee attempted to have them reinstated.

The provision for use of an automobile to go to work was not within the scope of the law requiring payments for medicine, crutches, and apparatus necessary to support or relieve a portion of the body. There also was no medical reason why the claimant could not have taken public transportation to and from work. The court said that prior voluntary provision for transportation does not establish a need for its unlimited continuance. Although there was medical proof that whiskey is a good vasodilator, there was conflicting testimony as to the improvement in claimant's condition due to its use. The court felt that the record did not justify its continuance. Reversed and remitted.

Carniato v. Foster Wheeler Corp.; New York Supreme Court, Appellate Div., Third Judicial Department. No. 1042. March 11, 1959.

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(For details, use Key # G-6 on card on page 1)

BRONCHITIS—TUBERCULOSIS—Causal Connection—Occupational Disease

The claimant was entitled to compensation for an occupational disease which activated a dormant tubercular condition. The claimant was employed in a wire plant and was required to handle steel wires passing through open tanks containing acids and various chemicals. There was evidence that in the various processes on which he worked smoke and irritating fumes were given off, and he testified that they caused him to cough violently and to raise blood. The medical evidence as a whole provided a substantial basis for a finding that the irritative bronchitis was an occupational disease causally related to his work, and that it activated a dormant tuberculosis. Therefore, both conditions were causally connected to his employment. Award affirmed.

Bazzini vs. Washburn Wire Company, Inc.; New York Supreme Court, Appellate Div. Third Judicial Department. No. 910, March 11, 1959.

Rural First Aid

People living in rural areas should master the "Four B's" of farm injuries, according to Dr. C. Thomas Flotte, a surgeon at The University of Michigan Medical Center.

Farmers and other persons who live or work some distance from professional medical care can save lives if they handle emergencies properly.

Treatment for most rural casualties involves the "Four B's" of breathing, bleeding, breaks and burns, Flotte reported. He offered a four-point program for the emergency control of such accidents:

Bleeding. "The best method for stopping the flow of blood is to apply pressure directly onto the wound. Simply put a piece of material on the wound and push." He claimed that pressure alone will stop bleeding in more than 90 percent of all accidents. "Tourniquets should be used sparingly, because they often result in the ultimate sacrifice of the limb."

Breathing. Corrective measures must be taken immediately because "an individual will rarely live more than five minutes without air." Any obstructions—foreign objects or false teeth—clogging the windpipe must be removed at once. "Another thing that is sometimes forgotten is that the tongue will slip back into the throat. Grab it forcibly and pull it forward."

If artificial respiration is necessary, "the best and simplest method is mouth-to-mouth respiration. Clamp the victim's nostrils to prevent the escape of air, then place your mouth directly over his. Force a lungful of air into him. He will exhale it as soon as you break the mouth-to-mouth contact because of the elasticity of his lungs."

Breaks. "The old saying of 'splint them where they lie' is just as true now as it was a hundred years ago." Dr. Flotte explained that emergency splinting simply immobilizes the limb. A professional splinting job will be done by the doctor. "You can immobilize the limb with any material readily availible, including a rolled up newspaper."

Burns. "Any burn that covers more than 10 percent of the body surface must be considered serious. The only thing you should put on such a burn is a clean or sterile cloth. Only the doctor should decide whether to apply ointments, lotions or anything else to a major burn." Emergency treatment for burns, Dr. Flotte declared, should be designed exclusively to preventing further contamination. The human skin is an excellent defense against germs, but once the skin is burned the threat of infection is very great.

The U-M surgeon said that in all forms of farm injuries, there is serious danger of shock. It is highly important to take steps to prevent or delay the onset of shock.

Precautions include: elevating the legs above the head; giving warm fluids if there is no abdominal injury; and personal reassurance, because a certain part of shock is psychogenic in origin.

Why Is Carbon Tet Toxic?

Two scientists at The University of Michigan Medical Center have shed new light on the mechanism of chemical poisonings. Deane N. Calvert and Theodore M. Brody presented their 2½-year study of the toxic effects of carbon tetrachloride, a common cleaner and solvent, to the annual meeting of the Federation of American Societies for Experimental Biology. Their work may lead to improved treatment for persons poisoned by a wide group of industrial chemicals known as chlorinated hydrocarbons.

They found that these chemicals themselves are not poisonous, but that they trigger a massive and prolonged discharge of adrenaline within the body. The resulting upset of the system can prove fatal.

Adrenaline is the "emergency" hormone that is released by the body to sharpen natural defenses in moments of stress, fear or flight. However, an overload can severely damage the liver.

The researchers, both members of the Pharmacology Department in the U-M Medical School, have traced a definite chain reaction. The carbon tetrachloride, they found, affects the brain which then orders a wholesale discharge of adrenalin. This somehow breaks down the body's stored fat and fills the bloodstream with fatty acids. At the same time, it impairs the blood flow to the liver so that organ cannot function normally. If this process goes uncorrected, the poisoning will prove fatal.

The researchers discovered that they could interrupt this chain reaction simply by blocking the signals from the brain. When that is done, test animals show no ill effects from near-fatal doses of carbon tetrachloride.

THE BASICS OF NOISE CONTROL

Noise may be defined as unwanted sound and therefore is subject to individual differences of interpretation. For example, to a music lover the strains of a Viennese Waltz may sound very pleasing whereas a person who dislikes music may regard it as unwanted sound, or noise. Similarly, a dog fancier would not likely be disturbed by the barking of his favorite setter but it is doubtful if it would be appreciated by a tired night watchman trying to get some sleep during the day. Also different attitudes toward the same noise may be created by different circumstances of exposure. For instance, the blowing of horns during a New Year's Eve celebration would be considered as part of the party spirit, but to be awakened the next morning by the children blowing the same horns would not create the same spirit of revelry.

Yes, noise is many things to many people and so it is impossible to give it any truly objective definition. For the purpose of this article we will be concerned chiefly with industrial noise, its effects and methods of elimination or control.

What Is Sound?

Sound is defined as airborne vibration produced by a vibrating body and if the vibrations, or sound waves as they are called, are within a certain range of pitch and loudness when they enter the ear, they produce the sensation of hearing. Under normal conditions of temperature and pressure, all sound waves travel at a constant speed of about 1120 feet per second (about 763 miles/hr.), regardless of pitch or loudness.

Every sound has three characteristics:

1. Frequency—the number of complete vibrations of the sound wave per second measured in cycles per second. Frequency determines what the ear registers as pitch. For example, centre C on the piano has a frequency of 250 cycles per second and is recognized as a certain pitch. The same key, one octave higher has a frequency of 500 cycles per second or twice as many vibrations and a correspondingly higher pitch. Frequencies below 18 cycles per second and above 18,000 cycles per second are usually beyond the range of normal hearing.

2. Intensity—the amount of energy in the sound wave. Intensity is interpreted as loudness by the listener. The human ear can hear sound through a wide range of intensities. As a matter of interest, the intensity of the loudest sound which the ear can tolerate without a sensation of pain is about a trillion times greater than the intensity of the faintest audible sound.

3. Quality or timbre—refers to the type of sound. Two notes with the same pitch and intensity may differ in quality, for example, the centre C note on the piano will sound different to the same note played on a violin or saxophone.

Measurement of Noise Levels

The unit used to measure the intensities of sound has been the decibel. It is a relative quantity and the intensity is related to a sound pressure of 0.0002 microbars; a microbar is approximately one-millionth of atmospheric pressure. The following is a list of sounds with approximate levels in decibel measurements: The weakest sound which can be heard with very good hearing in extremely quiet surroundings is 0 decibels and this is used as the starting point on the scale of noise levels.

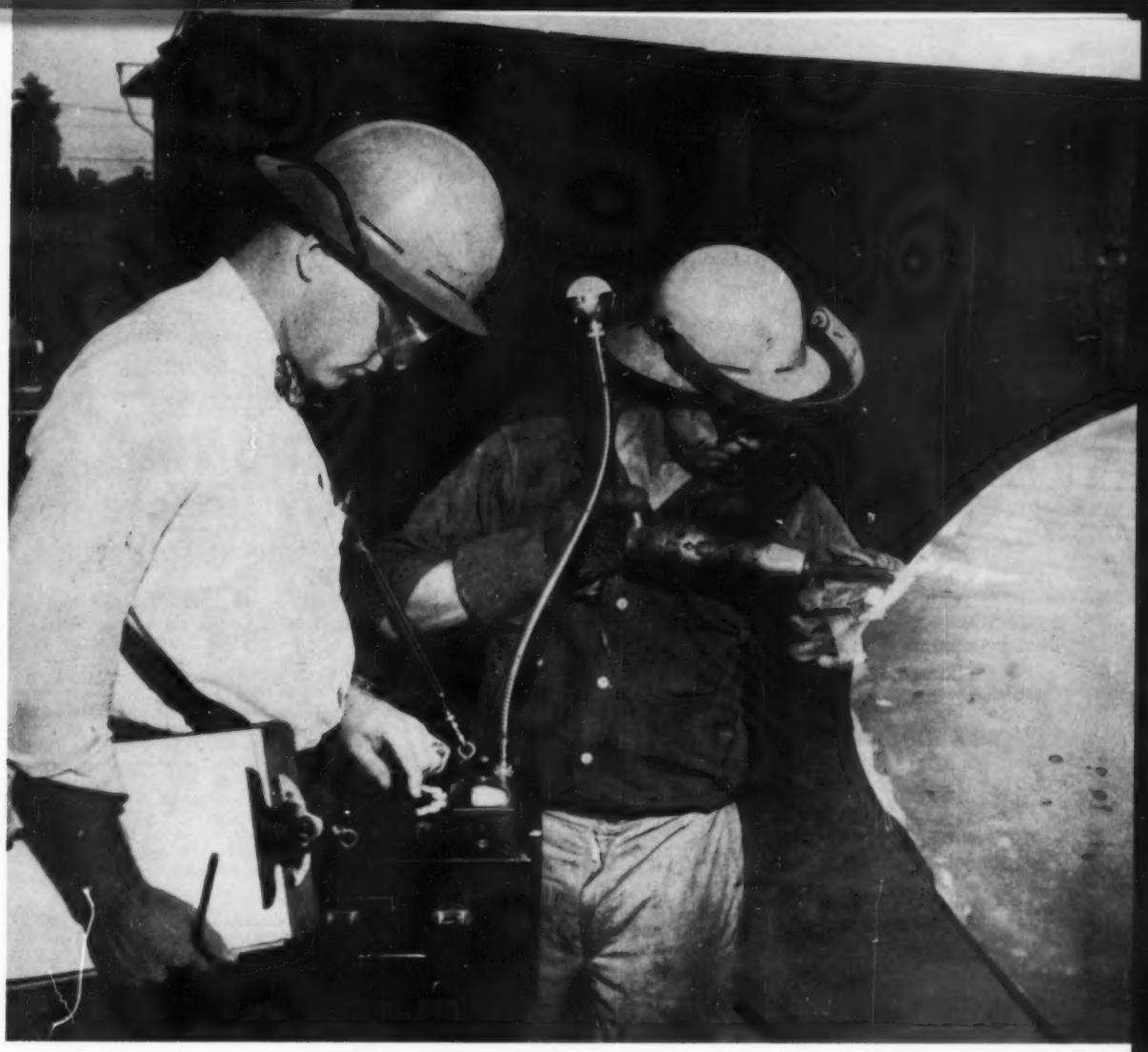
Whisper	**20**	**decibels**	very faint
Low Street Noises	**40**	"	faint
Normal Conversation	**60**	"	moderate
Heavy Traffic	**80**	"	loud
Inside a motor bus	**90**	"	loud
Subway	**100**	"	very loud
Aeroplane	**120**	"	deafening
Jet	**140**	"	threshold of feeling (the level of intensity at which the person experiences ear pain).

The over-all intensity level of noise in a machine shop is not the arithmetic sum of the intensity levels produced by individual machines; intensity levels vary logarithmically. For example, two machines, each with noise levels of 60 decibels, would produce a combined intensity of 63 decibels, not 120 decibels as might be expected. In other words, a doubling of sound intensity represents an increase of three decibels. Conversely, a decibel increase is equivalent to an increase of 26% intensity.

The frequency (pitch) of sounds has a direct effect on loudness to the listener. High frequency sounds of low intensity appear much louder than low frequency, low intensity sounds. For example, the chatter of a rivetting hammer sounds much louder than the rumble of thunder although they may be of the same level of intensity.

At high intensity levels, all tones of equal intensity sound almost equally loud regardless of frequency.

At low intensity levels, a given change in intensity produces a larger change of loudness at low frequencies than at high frequencies, whereas at high intensity



levels, given changes in intensity produce almost the same changes in loudness regardless of frequency.

The following is a list of industrial operations with approximate noise intensities in decibels:

Spinners, looms, lathes	**80– 95**	**decibels**
Screw machines, punch presses, riv-etters, cut-off saws	**90– 95**	"
Planners, routers, sheet metal, speed hammers	**110–115**	"
Drop hammers, chipping hammers	**110–125**	"

Effects of Noise

Prolonged exposure to very high intensities may result in impairment of hearing unless some form of ear protection is used.

Noise can be a decided nuisance in that it causes speech interference, makes telephone conversation difficult and in fact can be very irritating and annoying. This tends to create nervous tensions and lower the morale of workers.

In addition, excess noise can have an adverse effect on safety by masking the approach of vehicles, overhead cranes and other mobile equipment, leading to serious accidents. Also verbal orders may be misinterpreted if not clearly heard and thus possibly create confusion and delay in production schedules.

Signs and Symptoms of Industrial Deafness

Industrial hearing loss is a progressive condition and the worker is frequently unaware that anything is wrong until irreversible damage has been sustained. The first subjective indication is inability to carry on a conversation in which several take part—so-called society deafness. The earliest defect demonstrated by actual audiometric measurement is confined to a comparatively small range of high pitched tones about 4090 cycles per second. This defect is present in all

(Continued on page 39)

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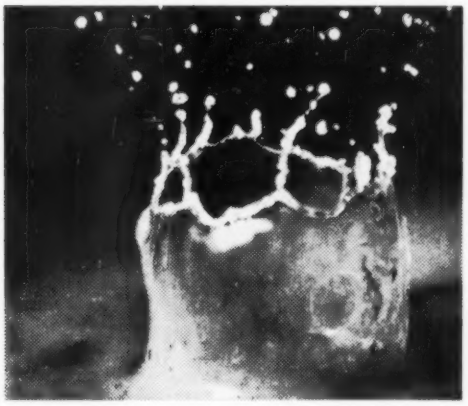


JUST A DROP IN THE BUCKET

A single drop of water looks like this when it splashes. Seems harmless? Yes, but this is what floods are made of.

A little carelessness here, a little thoughtlessness there may seem harmless too when you're in a hurry and want to get a job done. But when these are repeated, a flood of risks can drag you down. Plug the leaks in your working habits while you're still on top.

As we see it: Good safety habits are as easy to acquire as poor ones.

It Isn't the Fall That Hurts

It's the Sudden Stop!

You don't have to be a fall guy! Fight back!

1. **Watch where you are going.**
2. **Pick up things that can trip you up.**
3. **Hold onto handrails on stairs.**
4. **Make really sure that ladders are secure . . . and don't overreach.**

TOOL TIPS

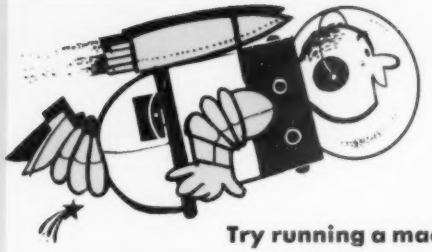
A chisel is NOT a screwdriver.

A screwdriver is NOT a prybar.

Pliers are NOT a wrench.

A wrench is NOT a hammer.

In short, only the RIGHT tool for the job is the SAFE tool.



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Try running a machine you d

It takes know-how and experience to
are authorized to run an unfamiliar machin
you're not sure, STOP! Ask your foreman!

You wouldn't take off in a space ship
the same with a machine in the shop.

Fly right! If you don't know where you

Three more reasons why there are so many traffic accidents — the car of tomorrow is being driven on the highway of yesterday by the driver of today.

Definition of a Bookie: A pickpocket who lets you use your own hands.

A plumber was giving some advice to his new assistant, "Above all, you must be polite and tactful."

The assistant said he could be polite but wasn't sure how to be tactful.

"Well, it's this way," said the plumber. "If you go into a bathroom to fix a pipe and a young lady is taking a bath, just close the door quickly and say 'Beg pardon, sir.' The 'beg pardon' is politeness. And the 'sir' — that's tact."

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WE DON'T KNOW WHERE WE'RE GOING BUT WE'RE ON OUR WAY

To get out of this world you don't have to head for outer space. You can leave this world *right on the job:*

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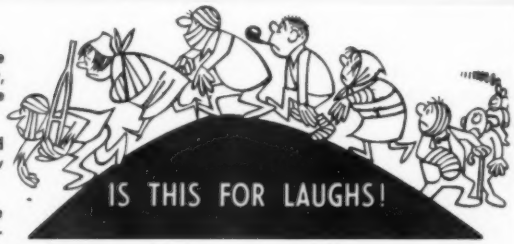

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There's nothing "practical" about a practical joke. We know... because we've been done in by "harmless pranks."

SAFE BET

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our job
our future.

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"Our shop has a 100% safety record — and we're keeping it that way!"

CARELESS WORK
CAN LEAD
TO COSTLY ACCIDENTS!

ACCIDENT ODDITIES

BEDTIME STORY: The family was moving out of its old home. The father was leaning out of a second-story balcony, giving directions to the moving men. He lost his balance and fell over the railing . . . but landed safely on his own mattress that was just being carried out the front door.

A TIP FOR THE ROAD

"Reading not required for a diploma these days?"

THE LOWDOWN ON SUNBURN OR GETTING MORE THAN YOU BASKED FOR

Even if it's no skin off your nose, sunburn doesn't make sense. So this year, you're determined to play it safe. As soon as the skin starts to turn pink, you call it a day. But a couple of hours later that pink has changed to a fiery red and your skin feels as if you've had a hot-foot all over.

How come? Well, that's the way the sun burns.

Sunburn comes from the invisible infrared and ultraviolet rays. So you can burn even on a cool or hazy day. The infrared rays go to work at once, turning the skin pink in 15 minutes to half an hour, depending on the individual. But the ultraviolet rays are the ones that do the real damage. They go deeper and the effects may not show up for an hour or even longer.

So play safe. Good tanning preparations help protect you when applied according to directions. And the first few times you're out, put yourself on a sunshine diet. There's no point in getting more than you basked for.

FOR THE MISSUS

by Margo Fulton

SMOOTH SLIDING: Having trouble with the window screens that stick because of rain or grit? Here's a simple way to make them slide more smoothly: Remove the screens and clean or wipe the edges. Then rub a little wax (a candle or a piece of paraffin is fine) along the edges so they will glide easily in the grooves. Waxing the edges is also good for doors and drawers that stick.

UNSAFE USES FOR PLASTIC BAGS: Transparent plastic bags are a popular method of packaging food products and other household items these days. And the empty bags can be useful in many ways; but keep them away from small children. Youngsters like to pull them over their heads as space helmets, unaware that the thin plastic will cling tightly to their faces. Many children have been suffocated in this way.

IRONING TIP: For quicker ironing, try putting some aluminum foil under the cover of your ironing board. The aluminum reflects the heat. It's especially helpful with a steam iron.

Basis of Noise Control
(from page 33)

forms of industrial deafness and since the normal range of speech is between 300 and 3000 cycles per second, subjective deafness is not an early symptom.

About one-half of the cases report buzzing, droning or humming sensations in the ear. These are usually bilateral and may be transitory but are not necessarily related to the degree of deafness.

Another less common symptom is the ability to hear when exposed to noise while showing marked impairment of hearing on functional tests.

Pain in the ears and acoustic after images occur only rarely; other symptoms such as headaches and nervousness are occasionally reported.

When investigating hearing loss, causative factors other than excessive noise must be considered. These include the effects of (a) Changes in temperature, barometric pressure and humidity, (b) Bacterial infections, (c) Chemical, electrical and mechanical influences, (d) Hereditary tendency, (e) Senile deafness.

Means of Reducing Noise

There are five approaches to this problem:

1. Machine Design—Good design and proper manufacture does much to eliminate noise. There have been many improvements in design in recent years.

2. Substitution of a less noisy operation where possible—i.e. spot or arc-welding for rivetting in some operations; flame gouging for chipping of large castings; pressing or rolling instead of forging; belt drive instead of metal gears; compression rivetting instead of pneumatic rivetting.

3. Control of Noise at the Source—In many instances, the application of a few simple noise control measures may reduce intensity levels considerably. These include the insertion of rubber or other resilient mounts under machines to eliminate vibration noises; the use of resilient floor coverings; reconditioning of machines (exchanging worn parts, etc.); hooding and screening of noisy operations; the installation of expanding tubes containing baffles or coarse steel wool to muffle exhausts; wrapping asphalt impregnated canvas duck around bar stock tubes; placing sand bags on lower edges of speed rings for hydraulic turbines during chipping or grinding operations; inside coating on chambers or ducts of exhaust systems; substitution of wooden for metal benches for holding castings; preventing metal from touching metal by asphalt materials; the substitution of rubber for metal wheels on dollies, bunkers and other conveyances.

4. Use of Sound Absorptive Materials—In some instances where warranted, sound absorptive materials will serve to reduce noise levels. These include acoustic tiles on walls and ceilings, plasters, spray-on compositions, prefab blankets (glass, wool, etc.), baffles suspended from ceilings, mastic flooring, etc.

5. Isolation of Noisy Machinery—In some places it

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(For details, use Key # G-7 on card on page 1)

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may be possible to confine noisy machines and operations to one area of the plant thus reducing the number of people who will be exposed. Other measures include the use of insulating partitions with tightly closing doors to isolate noisy operations, partial enclosure of individual machines with sound absorbing shields, and performing noisy operations in acoustically lined cubicles.

Personal Protective Measures

If it is impossible or impractical to reduce noise intensity levels to within safe limits, then it will be necessary to supply exposed employees with some form of ear protection. The type used will depend largely on the intensity level and the desired decibel reduction.

1. Ear Plugs Molded by the User—Pliable balls of wax and cotton are the simplest and least expensive but also the least effective. They are useful for protection against nuisance and irritating noises.

2. Molded Plugs or Stopples—These are made of rubber, neoprene or vinyl plastic and are inserted into the ear canals. If they are the correct size and properly fitted into the ear, they provide reasonably adequate protection, in some instances achieving attenuation of 35 decibels against high frequency noises, but they do not provide much protection against low frequency sounds. A variation of the ear plug is the ear valve, which permits hearing of normal conversation but eliminates high frequency noise.

3. Muff Type Protectors—There are two conventional designs of this type of protector: (a) A headband with plastic or sponge rubber muffs which fit over the ears. (b) A headband equipped with soft pliable plugs to fit into the ear canals. These, too, give good attenuation at high frequencies but less protection at low frequencies.

Speech More Intelligible

One type of safety ear muff has a headframe of stainless steel piano wire with a soft sponge rubber pad for comfortable support at the top. The cups are molded from strong lightweight plastic with a plastic sponge filter to absorb echoes. It provides very appreciable sound attenuation of both low and high frequencies, and makes speech more intelligible in noisy surroundings.

4. Helmets—Most of the above-mentioned devices provide protection against the transmission of noise through the ear canal, but none of them are designed to reduce sound energy transmitted to the bones of the head. This purpose is achieved to a certain degree through the use of a firm type of helmet, similar to a football or crash helmet. These are expensive, warm and hard to get on and off, but in some cases their use is warranted, particularly where noise intensity levels are very high (above 140 decibels). Ideally, the face should also be covered for maximum effectiveness of the helmet.

Soft cloth helmets, fitted with various types of ear muffs, provide adequate protection against moderate noise levels, and they are also more comfortable to wear.

A combination of earplugs or earmuffs and a helmet give better protection than either alone and should be used to protect against intimate exposure to jet engine noises.

Medical Supervision

In noisy environments, engineering control and personal protective devices should be supplemented by medical supervision. Where it is possible, a record of each employee's hearing should be kept. There are a number of factors to be considered when assessing the degree of hearing loss, including the duration of exposure, length of exposure period, whether the noise is continuous or interrupted (the latter is more harmful), characteristics of the work area, the age of the person, his previous history of exposure and of disease, whether or not protective equipment is used, and constitutional factors such as individual susceptibility. Periodic checks should be made to determine hearing loss and to assess the effectiveness of the program. When evaluating hearing loss it is important to consider the individual's past history and previous noise exposure. A screening audiogram on pre-employment examination will often reveal defective hearing and periodic examination will soon detect any progressive hearing loss. These checks will serve to eliminate susceptible individuals and may indeed reflect the effectiveness of the noise control program in any given situation.

Employee Education

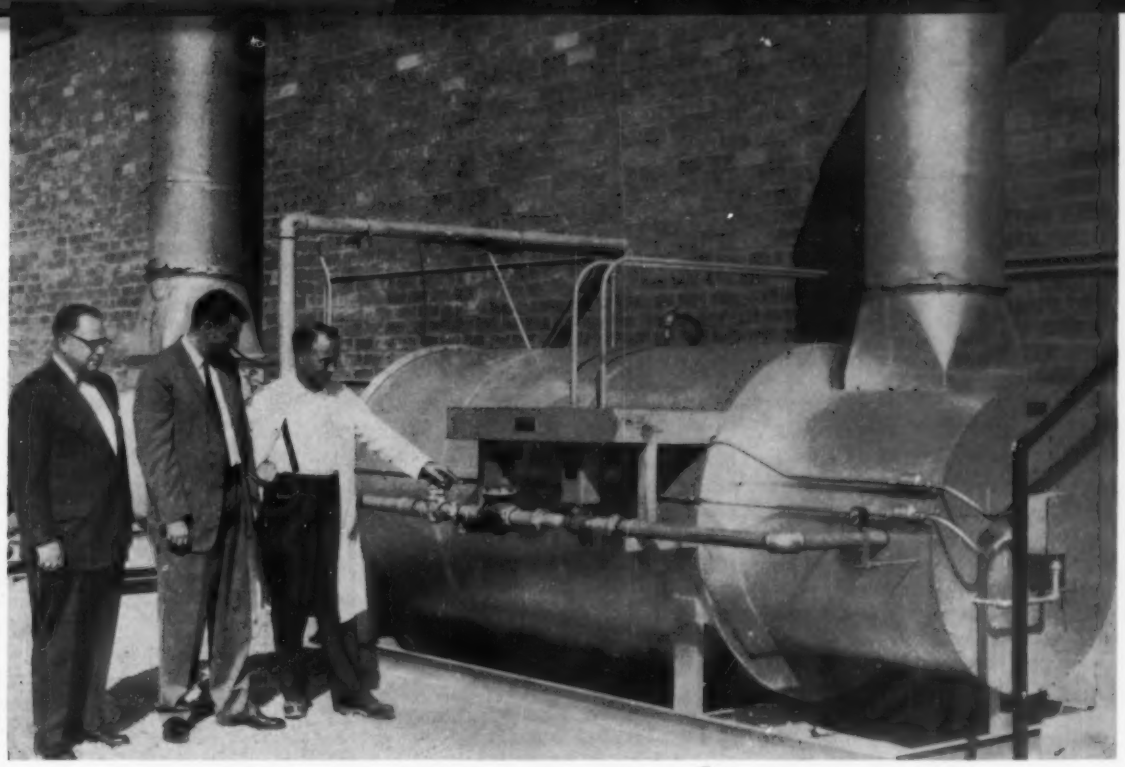
In many instances, gradual hearing loss is not too noticeable to the employee as long as it does not interfere with his daily routine. Also, partial deafness was formerly looked upon as a mark of distinction among such people as boilermakers.

For these reasons, it is often difficult to impress the employee with the necessity for wearing ear protection devices. For successful promotion of a hearing conservation program, it is necessary that the employee be convinced of its value. Ear plugs and muffs are not always comfortable to wear and will often be discarded unless the worker is compelled to wear them.

Proper fitting is important and this should preferably be done by the doctor, nurse or authorized technician. While this is being done the reasons for the fitting procedure should be explained. Also, a variety of devices should be available because a type which may be suitable for one may be quite unsatisfactory for another.

The hearing conservation program should be augmented by information such as films, posters and pamphlets and adequate supervision by foremen to ensure greatest success.

Material by courtesy of Canadian Occupational Health Division. Picture by courtesy of "Steelways."



vapor incinerator burns up air pollutants

Small particle size in the battle against air pollution often poses a problem. A case in point is the Armour & Company Cushioning Products Division plant in Los Angeles, which needed a way to eliminate extremely small-sized pollutants emitted during its vulcanizing process for manufacturing packing material of animal hairs. Due to the minute particle size, under one micron, the usual smog abatement equipment would not do the job.

Armour conducted a thorough investigation of various types of control equipment and worked closely with the consulting firm of W. C. L. Hemeon of Pittsburgh, Pa., in making their final decision. The solution was a vapor incinerator which eliminated both visible emission and odor.

Established in 1954 to manufacture packaging materials for aircraft, electronics, and furniture industries in 11 Western States, the plant processes animal hair with a liquid latex compounded from raw neoprene. The animal hair is a by-product of the company's many meat packing plants across the country. Shipped all over the world, the specially treated hair is used for comfort cushioning in furniture and for packing valuable instruments during shipment.

A combustion engineering firm was invited to install a small model of one of its vapor incinerators. These incinerators had already proved very successful in difficult smog-abatement problems in Southern California. Results were immediately apparent to Armour management and engineers from the Los Angeles County Air Pollution Control District who had helped to evaluate each installation.

At 600°F., all visible smoke was eliminated but it was decided that a higher operating temperature was desirable. Accordingly, a permit was granted by the APCD specifying incinerator operation at 900°F. Later, Armour was given verbal approval by the APCD to operate the unit at 800°F. The unit has proved to be surprisingly economical.

The incinerator employs an induced draft system which greatly simplifies the combustion problem, eliminates the combustion burner blower, and allows the fan to work on clean air, a factor which eliminates fan cleaning. Because fuel combustion was a major concern, the unit's fuel input is precisely modulated to achieve the desired temperature.

An important feature of the installation making for fuel economy is that outside air is not used for combustion in the incinerator; only from the gases within the vulcanizing oven itself at 275°F.

The combustion system is carefully engineered to "fail safe" and meets Factory Mutual Insurance requirements. As a safeguard, the Armour burner automatically shuts off under abnormal conditions such as: no product in the oven; failure of fan motor or failure to produce the proper draft (two types of safety interlocks are used); excessive stack temperature; malfunction of temperature controller thermo-couple; or improper flame in the pilot burner. The unit has also found a useful place in the varnish and oil processing industries.

Picture by courtesy of Hirt Combustion Engineers.

Ford Motor Company employees last year recorded the lowest injury rate in the company's history, R. T. Ross, manager of employee services, announced recently. Ford employees have recorded a 72 percent improvement in the injury-frequency rate since 1949. During the last 10 years, the rate has dropped from 4.72 per million man-hours worked to 1.32. Injuries that necessitate at least a one-day absence from work are used to determine the frequency rate. The Chicago Aircraft Engine Division led all company divisions with an over-all record that included an injury rate of only .70 per million man-hours.

Nine Ford units had perfect safety records in 1958. In the Detroit area, they included the M-E-L Division's general parts depot and station wagon plant; Ford manufacturing services and marine services, and the Rawsonville plant. Others were the Buffalo stamping and Green Island, N. Y., plants and the Chicago Ford assembly plant. The combined record of Tractor and Implement Division parts depots in Lincoln Park, Mich., and Des Moines, Ia., also was perfect.

Since 1954, the company has attained world safety records in glass and foundry operations, aircraft engine production and office administration. The company has more than 100 full-time safety engineers.

• • •

The American-Marietta Company presented 55 of their plants safety award plaques for completing 1958 without a single disabling injury. In presenting the plaques, Robert E. Pflaumer, President, congratulated the employees for maintaining perfect safety records and stated that with the wholehearted cooperation of every employee the American-Marietta plants can become the safest in the nation.

Accident prevention is a part of the Insurance Department headed by Peter Hermann, Insurance Manager and Alfred C. Kemp, Director of Safety.

• • •

A striking testimonial to one of the lowest accident frequency rates in the cement industry is being recorded this year as the Alpha Portland Cement Company's 32-year-old safety program approaches the million dollar mark in bonuses for safe working, paid to its 1800 employees. Nearly $70,000 was paid out early this year in 1958 safety bonuses at the company's nine plants scattered around the country.

Under the Alpha plan, begun in 1926, an employee receives a bonus of 1 percent of his wages, if an accident has not occurred at his plant during the previous payroll period.

Both frequency and severity of accidents are low at Alpha. For 1958, accident frequency rate was 2.47 injuries per million man hours as compared with 3.17 in 1957 and 3.21 in 1956. Last year's record was second best in Alpha's history. The average rate over the existence of the plan is 6.75, and is steadily decreasing.

Severity of accidents (number of days lost per million man hours) was the third lowest rate in the company's history at 162. In 1954, a record was set at 102, and in 1956, a rate of 114 was recorded.

Six of Alpha's nine plants were free from lost-time injuries last year, while the total lost-time injuries for the company numbered only seven. As a result, this year the company will receive five safety certificates from the Portland Cement Association. Over the years, Alpha has won 90 safety awards given by the association. This figure represents 90 accident-free years out of a possible 256 among the company's plants.

The prime factor in this outstanding safety record is the employees' cooperative attitude toward the company-sponsored safety engineering program. This program, supervised by Alpha safety director Howard Riefenstahl, is responsible for numerous safety incentive award plans.

In addition, prospective employees are given a thorough physical examination including a chest X-ray, back X-ray, and an audiometric examination. All employees are re-examined at two-year intervals. The company also pays half the cost of safety prescription eye glasses, if needed.

Alpha officials say the total amount of money paid in bonuses may exceed one-million dollars this year. They also point out that the company pays more safety bonuses each year—evidence that Alpha plants are safe places to work.

Alpha plants with accident-free records for 1958 are Martins Creek, Pa., Ironton, Ohio, Birmingham, Ala., Manheim, W. Va., Jamesville, N. Y., and Lime Kiln, Md.

• • •

The N. Y. Department of Health's Water Pollution Control Board recently commended Allied Chemical's Semet-Solvay Division on the installation of facilities to control water pollution in the Lake Erie-Niagara River Drainage Basins. Facilities designed to recover over 97 percent of the phenol effluent from the Harriet coke-making plant at Tonawanda, N. Y., have been placed in permanent operation. The pollution control facilities at the Harriet plant represent the culmination of more than two years of planning and consultation with state, local and national health authorities.

Semet-Solvay developed a unique recovery process for the removal of phenol from raw ammonia liquor. Phenol and raw ammonia liquor are by-products of coke manufacture.

In the recovery process, a solvent such as light oil is made to flow counter-currently with the raw ammonia liquor. The solvent removes the phenol, and in turn is treated with a caustic soda solution for extraction of phenol as sodium carbolate, which in turn is converted to a tar acid product. The solvent is then recycled.

• • •

A new world's safety record in paint and varnish manufacturing operations has been established by the Du Pont Company's Philadelphia finishes plant and Marshall Laboratory, according to records compiled by the National Safety Council.

As of December 31, 1958, employees of the plant and laboratory had worked 12,064,800 man-hours without a disabling injury, over a period of 1,862 consecutive days, or more than five years. This topped the previous record of 11,979,318 injury-free man-hours set by Du Pont's Parlin, N. J., finishes plant in 1949.

W. F. H. Mattlage, general manager of the Fabrics and Finishes Department, in congratulating plant and laboratory employees, said, "Your performance is particularly gratifying, not so much because it sets a new record for paint and varnish manufacturing, but because it demonstrates the soundness and practicality of our belief that all personal injuries can be prevented."

• • •

Koehring Company announces that each of its 10 plant locations reports considerably improved safety records for the past year, according to Foster Shoup, Training Director.

The Kwik-Mix Division at Port Washington, Wis., was first in the inter-plant competition for the third straight year, he said. The division had no disabling accidents.

Koehring Southern, Chattanooga, Tenn., placed second with a 2.9 frequency rate, based on per million man hours worked. Following with a 4.9 rate was the Buffalo-Springfield Division at Springfield, O. Koehring Division, Milwaukee, was fourth, showing a 5.3 rate. C. S. Johnson, Champaign, Ill. scored 7.2 and Parsons Division, Newton, Ia., was sixth with a 9.3 rate.

• • •

The Engineering and Development Department of the Chemstrand Corporation has completed eight years of safe operations, R. E. Wright, department director, has announced. The department began operations Feb. 26, 1951 and since that time has not had a disabling injury, according to D. B. Renegar, who supervises the safety program for the Department.

Renegar pointed out that five of the eight years in the safe record included pilot plant operations. He added that the Department has now exceeded 800,000 safe man-hours.

• • •

A new low accident frequency rate of 4.0 was posted by Allis-Chalmers in 1958 according to a recent company announcement. This was a reduction from 6.2 in 1957. The company-wide severity rate of 289 was well below the 513 mark experienced in 1957.

At the company's largest works in West Allis, the frequency rated also was 4.0—the lowest in its history. It marked the seventh consecutive year that employees lowered the number of disabling injuries for each million manhours worked.

At West Allis, the reduction was particularly sharp in 1958—37½ percent lower than the 6.4 frequency record set in 1957. This meant that only 106 employees lost work through plant mishaps compared with 201 the year before.

One of the reasons for the company's successful 1958 safety record is attributed to a "Knowing's Not Enough" campaign which stressed the importance of practicing the safety techniques learned in the past, both at work and home. The job of re-educating and pointing out the value of practicing safety was continually repeated in the program's theme.

The promotion, which was adapted from the safety campaign developed over a two and one-half year period by the United States Steel Corp., is being continued in 1959 with new appeals, such as the new slogan "Use Your Know-How."

Folders being distributed by supervisors this year to their employees carry actual case records of accidents due to falls, bad housekeeping and faulty material handling taken from the company's files.

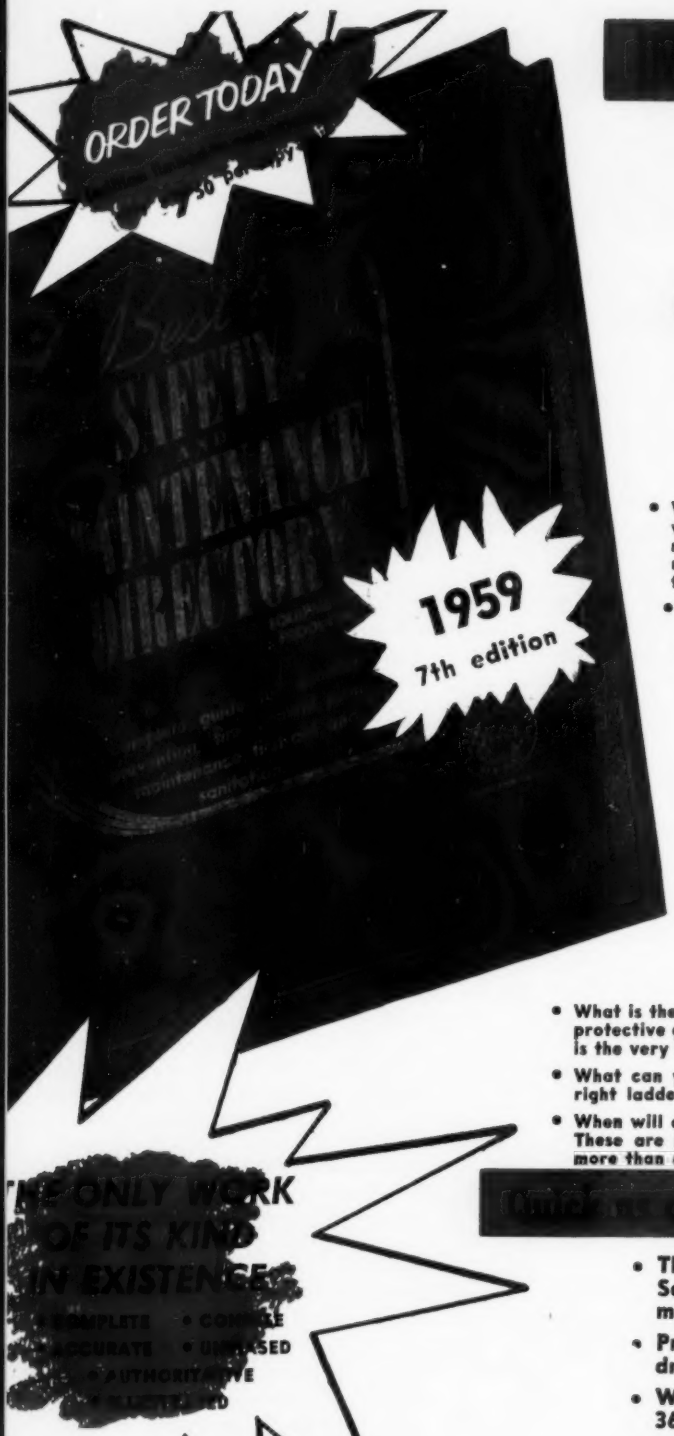
• • •

Major General E. C. Itschner, Army Chief of Engineers, presented his Award of Honor for Outstanding Safety Performance during 1958 to the U. S. Army Engineer Waterways Experiment Station, Vicksburg and Jackson, Miss. General Itschner commended the employees of the Waterways Experiment Station for contributing more than any other separate installation to the impressive safety record of the Corps of Engineers. There were only three minor accidents during the year.

• • •

The highest safety award of B. F. Goodrich Chemical Company—the President's Cup—has been awarded to the company's Louisville (Kentucky) plant for an injury-free record during 1958. Over 2,500,000 man-hours have been recorded since the last disabling injury. The Niagara Falls (New York) plant also completed 1958 without a disabling injury; however, the Louisville plant worked more actual man-hours during the year and was adjudged the winner.

In winning the 1958 award, the Louisville plant joined the Avon Lake (Ohio) General Chemicals plant as a two-time winner of the cup. Permanent possession of the trophy is given to the first plant which wins the award three times. John R. Hoover, president of the chemical firm, presented the trophy to John L. Nelson, Louisville plant manager, at recent ceremonies. Walter L. Cato is safety engineer of the plant.



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- **What are the various types of electrical equipment approved by the Underwriters' Laboratories for specific conditions of hazardous gases, vapors and dusts . . . who makes them?**
- **What are the vapor hazards of flammable liquids . . . what fire prevention containers and equipment will do exactly the right job?**
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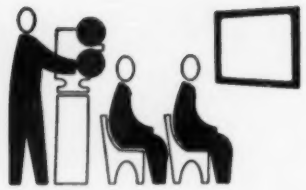

Safety on Film

Cement Safety Film

The Portland Cement Association has announced release of a new 16-millimeter sound-and-color motion picture on safe job performance in portland cement manufacturing plants. Entitled "Growing Pains," the film's 33-minute story emphasizes the importance of a mature attitude toward safety among plant workers.

The central figure is a worker who learns from the example of his 11 year old son a lesson in growing up to his responsibilities for safe conduct. By digging deep into the human rather than the mechanical causes of accidents, the story brings out the safety value of teamwork, observance of rules and instructions, discipline and due regard for consequences. The theme is realistically and believably presented and applicable to any situation requiring safety awareness. It is therefore suitable for showing to all groups and agencies interested in safety problems. "Growing Pains" is available from Portland Cement Association, 33 West Grand Avenue, Chicago 10, Ill.

Fire Film Listings

A listing of more than 200 motion picture films on fire has just been published by the National Fire Protection Association. Titles of available films cover a wide range of subjects including home and personal fire safety, industrial fire protection, aviation fire control, forest, brush and grass fire fighting, fire department operations and civil defense.

The "Fire Control Film List" was compiled by the editors of "Firemen," NFPA-published fire service magazine, in response to an ever-growing demand for such a comprehensive listing of available films on fire subjects. Motion picture film producers and distributors were surveyed to obtain this up-to-date listing of films useful for showing to small groups and in some cases, for use in television. Each description includes running time, brief summary of content and purchase price, rental fee or loan arrangement.

The 28-page "Fire Control Film List" is available (50 cents a copy) from the NFPA Publications Department, 60 Batterymarch St., Boston 10, Mass.

Fire Barrier Film

"Fire Barriers by Overly," a 16mm. color and sound motion picture, has been released by the Overly Manufacturing Company. The six-minute film shows an actual fire test being conducted at the Underwriters' Laboratories in Chicago on a new fire barrier made up of metal and glass doors and frames. The unit withstood the test and was awarded an Underwriters' Laboratory "C" label, which means the frames will withstand fire and smoke for 45 minutes.

The film tells how these units can be placed as smoke and fire screens in the corridors of hospitals, schools, hotels, and other buildings, thus providing an area of refuge within the building. People can be quickly moved into this area, protected from the smoke and flames, and then be evacuated in a more orderly manner.

Suitable for showing to architectural and engineering groups, fire protection officials, and insurance personnel, the film is available free from Overly Manufacturing Company, Otterman Street, Greensburg, Pa.

New Safety Film For Linemen

"There are **old** climbers and there are **careless** climbers, but there are **no** old, careless climbers." That terse truism was stated in the "Lifeline of a Lineman"—a safety film previously prepared by Buckingham Manufacturing Co., which merited and received wide distribution.

The 1959 sequel to that film is titled "The Proper Care of Linemen's Climbers" and has just been made available for purchase or rental (or for group showing by a Buckingham distributor) to construction and maintenance crews in the utility and communication fields. The new film graphically depicts the exhaustive mechanical and technical procedures used in developing a climber which, with sensible usage, will assure maximum safety and long wear.

There are close-up shots of a series of rigid tests which determine the exact hardness of steel, tests which eliminate any possibility of loose spurs, tests for ductility and tests for other safety factors. This factory-tour-on-film is extremely interesting and informative to the lineman who must place such great dependence on the climber he wears.

As in every other product, built-in safety can be preserved only by careful use in the field. The Buckingham film emphasizes the vital need for periodic inspection and gives indispensable tips on the proper care of climbers. It stresses the need for inspection for cracks which may have developed from long and negligent use in the field. It portrays proper shaping and filing operations. The illustrated use of the linemens gauge shows what needs correction, it points out where weakness may induce future trouble. It tells what is to be done and where to do it before real danger develops. It treats the subject of safety in a comprehensive manner and avoids non-essential clap-trap.

This 16mm black and white sound film is timed at less than 20 minutes viewing. For details write to: Buckingham Manufacturing Co., Inc., Binghamton, New York.

THE FIRE FRONT

Firemen's Training School

The 30th Annual Firemen's Training School, sponsored by the State Firemen's and Fire Marshal's Association of Texas, and conducted by the Texas Engineering Extension Service, in cooperation with the Texas Education Agency, will be held on the campus of Texas A. & M. College, July 19th to 24th, inclusive. At that time approximately 1400 firemen and fire marshals will be present for a week of intensive training. These men will represent some 425 Texas cities, industries, and Army, Navy and Air Force Installations, bases and stations. Last year 15 states were represented in addition to Texas.

At registration, the men will select the course they desire, and during the week will complete 30 hours of training, rotating in small groups for class periods of three to six hours in subjects included in their selected course. They will use all types of equipment to control various types of fires; disassemble and overhaul apparatus and equipment; and some will attend classes for technical information, observe demonstrations, or practice teaching with other students.

All types of approved extinguishers and rechargers, respiratory and safety equipment, apparatus, visual and other training aids are furnished by manufacturers and distributors. Several of the major oil companies furnish gasoline, kerosene, crude oil and butane for pit and tank fires. In addition four houses and several other buildings will be burned in structural fire-fighting training.

The courses offered this year are: 1. Basic Course, 2. Advanced Course, 3. Basic Fire Marshal's Course, 4. Advanced Fire Marshal's Course, 5. Fire Department Instructor's Course, 6. Fire Officer Training Course, 7. Armed Services Fire Protection Course, 8. Industrial Fire Protection Course, 9. Fire Pump Maintenance Course.

Total expenses per man including room in college dormitories, meals, banquet, and registration for the five days, will be $39.50. Registration will be at Memorial Student Center on July 19, noon to 10 p.m. and July 20, 7 a.m. to 8 a.m. Classes will be from 7:30 to 4:30 daily and until 2:00 p.m. on Friday. Men should bring boots, bunker clothing, or clothing suitable for hard work. For further information, write: Texas Firemen's Training School, A. and M. College System, College Station, Texas.

April Losses Drop

Estimated fire losses in the United States during April amounted to $90,669,000, the National Board of Fire Underwriters has reported. This loss represents a decrease of 8.5 percent from losses of $99,061,000 reported for April 1958, and a decrease of 9.0 percent from losses of $99,610,000 for last March 1959.

Losses for the first four months of 1959 now total $401,402,000, a decrease of 1.0 percent from the first four months of 1958, when they amounted to $405,554,000. These estimated losses include an allowance for uninsured and unreported losses.

Fireman Sparks Fire Safety Collection

While recuperating at home from an injury suffered in line of duty, a Brooklyn, N. Y. fireman recognized the lack of fire prevention and fire control material available to the general public. With time on his hands, he decided to do something about correcting the situation.

Using $500 of his own money, Lt. Martin Chayette spent several months of intensive work culminating in the largest collection of fire prevention books, catalogues, pamphlets, magazines, bulletins, brochures available anywhere.

The Fire Protection Collection is housed in Central Branch of the Brooklyn Public Library, Science & Industry Div., Grand Army Plaza (Brooklyn 38, N. Y.) where it is on display seven days a week.

Under the direction of Francis R. St. John, chief librarian of the Brooklyn Public Library, **the collection is available for reference without charge** to members of industrial organizations, fire departments, chemists, engineering societies, schools, architects and the general public to focus attention on the vital need for reducing the skyrocketing fire losses which cost the nation over one billion dollars and approximately 10,000 lives each year.

Utilizing his own funds to pay for postage and stationery supplies, Lt. Chayette sent letters of appeal for all available literature to equipment manufacturers, fire underwriters, insurance companies and fire departments. Moreover, the public spirited fireman paid for binding for easy access much of this material, ranging from the simple level of what type of electrical fuses are best suited in the home to the complex area of the hazards of atomic radiation.

A few years ago the lieutenant was struck by falling debris while fighting a fire in Brooklyn and the injury to himself and others as well as the damage to property might have been averted, he thought, if the building occupants had known how to prevent or at least combat the fire in its incipient stages.

For further information about the collection address inquiries or calls to the Fire Protection Collection at the address given above.

Warning Horn Aids Fire Detection

Inexpensive warning horns, powered by their own self-contained supply of a nonflammable liquefied gas and triggered by a simple heat-sensitive device, can help prevent tragedies such as the recent Chicago school fire by warning of fire conditions before a blaze gains headway.

Installed in areas where fires are most likely to start, such as furnace rooms and fuel or waste storage areas, the devices emit an ear-piercing blast of sound (rated at 100 decibels or more) for five minutes or longer after being activated by heat. Fusible metal plugs, which melt at a predetermined temperature releasing the liquefied gas to blow the horn, make these safety devices self-contained units, requiring no wiring or external controls.

Developed several years ago and now used widely in industrial, commercial, home, and apartment house applications, the warning horns depend upon a liquefied gas, such as Freon propellant, as their source of power because it changes readily from a liquid to a gas when released by melting of the fusible plug. A little of it goes a long way in blowing the horn, for in changing to a gas, the nonflammable propellant expands 240 times its liquid volume.

Revised NFPA Inspection Manual

A new guide to check and improve the safety of property from fire has just been published by the National Fire Protection Association. The NFPA Inspection Manual, standard work of its kind, is now available in an enlarged and revised second edition. Designed for the use of property owners, fire departments and inspection offices, the pocket manual provides helpful information to beginners but also contains a selection of material which even experienced inspectors have frequent occasion to consult.

Subjects covered include inspection procedure, what to look for in various occupancies, heating hazards, inspection of protective equipment, what "approvals" mean, how to make plans and reports.

New Subjects

New material in the 320-page book ranges from sections on gas appliance connectors, factory-built chimneys and electrical equipment in paint-spraying areas, to flame-spread ratings of wall finish materials, extinguisher ratings and sprinkler requirements.

Editor of the 1959 edition of the Inspection Manual is Horatio Bond, chief engineer of the National Fire Protection Association. It was prepared under the direction of the NFPA Committee on Fire Inspection, of which William G. Hayne of the New York Board of Fire Underwriters is chairman.

The Inspection Manual is available, at $4.00 per copy, from the National Fire Protection Association, 60 Batterymarch Street, Boston 10, Mass.

Powered Chain Saw For Firemen

The classic fireman's axe has been given an assist by automation. The municipal fire department of Rochester, N. Y., has decided, after weeks of exhaustive tests, to equip each of its fire engines with a gasoline-powered chain saw.

In many fires, according to department officials, it is necessary to cut holes in roofs, floors, or walls to effect rescues or to create ventilation in certain sections of burning structures.

The Rochester fire authorities have found that chain saws, with their great speed, economy, and portability, provide a significant increase in efficiency and dependability in extreme emergencies. The rapidly traveling cutting teeth slice easily through roofing, clapboards, tarpaper, insulation, studs and rafters. Their quick action can mean the difference between life or death.

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GRATING AIDS FIRE PROTECTION

Open flooring is proving a valuable supplement to a fire protection sprinkler system at The Dow Chemical Company's Midland, Mich., plant. This combination of open flooring—or grating—and the sprinkler system is economical and effective because:

1. It requires fewer sprinkler nozzles.

2. It permits water to shower or pour through floor spaces to lower levels.

In addition, the grating assures safer footing and easy maintenance.

Howard Bezenah, assistant chief engineer for Dow Chemical at Midland, says:

"Use of grating for floors permits us to concentrate sprinkler nozzles in quantity in upper plant areas. This design makes possible a tremendous increase in effectiveness of the sprinkler system. Water from the system can pour easily from upper to lower floors.

"Because the system is designed for maximum effectiveness, the company enjoys a good insurance rate."

Several hundred thousand square feet of 1 x $\frac{3}{16}$-inch grating is employed at Dow's Midland plant where approximately 10,000 men process almost 600 different kinds of chemicals. Production facilities are as high as 210 feet and may have as many as 21 levels.

Dow Chemical made its first installation of the corrosion resistant grating five years ago. The twisted bar surface of the grating provides safe, sure footing even in wintry weather. There is little tendency for snow and ice to collect on the open flooring.

"And, these floors are easy to maintain," according to Mr. Bezenah. "They can be cleaned easily with a wire brush, or they can be sand blasted. Actually though—as far as we're concerned—they're self-cleaning. Rain does a pretty good job of cleaning the grating."

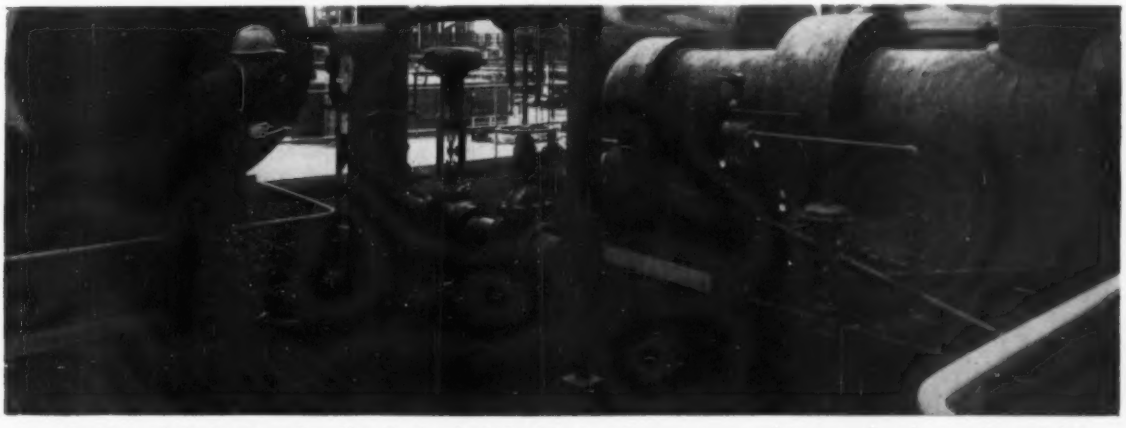
In addition, the grating reduces the number of drainage lines required for outdoor processing stations. Mr. Bezenah points out that the reduced number of drainage lines is important in lowering construction costs of these stations.

"Also," says Mr. Bezenah, "grating eliminates one of the major causes of outdoor corrosion. Water usually gathers on a solid floor. It doesn't gather on the grating."

Electro-forged fabrication of the grating eliminates joints that are likely target areas for corrosive attack in the penetrating chemical atmosphere.

Grating here allows easy flow of water from sprinkler system around distillation columns and on the upper levels.

Pictures by courtesy of Blaw Knox Co.



Open flooring, of electro-forged grating, in chemical plant heat exchanger area resists corrosion, is easy to maintain.

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Hot Liquids

(from page 9)

protecting against heat and hot liquids, there is now available aluminized glass cloth or asbestos, vinyl- or neoprene-impregnated on the inside. This is light-weight material giving free and easy activity and essentially the same protection as the cumbersome combinations formerly used. Coats, pants, gloves, hoods and boots are available in these new materials. Temperatures encountered in handling polymeric materials are generally not such as to require the use of "fire suits" also recently developed.

Every Precaution Taken to Prevent Injury

At the du Pont plant every precaution is taken to prevent injury to all personnel, and particularly those involved in the handling of hot polymers or the occasional "breaking into" a pipeline for maintenance purposes. When a polymer line must be opened, two men, each "suited up" for the hot work are used, with supervision keeping a watchful eye on the entire process. Fire extinguishers are kept handy in the eventuality that degradation of the polymer has occurred and it "pops" into flame in the line. Dependence on a single valve is taboo —either two valves, locked out, or a locked out valve and a blank must protect the men working on a hot material line from the possibility of material inadvertently flowing out of the line.

In addition to the special precautions necessary when handling polymers, all precautions are also taken in handling the more common chemicals, such as wearing rubber hood, coat, gloves, pants and boots when handling quantities of fluid caustics, or acids, respirators where dusts are encountered, air masks where toxic gases may be evolved and all the other more common safety provisions. The aim is to provide maximum rather than minimum protection to personnel.

A Central Safety Committee governs over-all safety in the plant and a Safety Activities Committee keeps a constant flow of promotional activities and programs on safety before all personnel. Rotation of the members of this latter committee assures a continuance of new ideas and material to plant supervision. Safety Activities Committee chairmen are chosen from various departments. In the accident-free year of 1957, the chairmen were: R. L. Burton, then Process Development Supervisor of the Technical Department; R. W. Hutzelman, Plant Methods and Standards Supervisor; W. W. Ehmling, Operations Finishing Area Supervisor.

Although protective equipment is provided and safety activities are promoted, it is made clear to all employees that it is essentially up to each individual employee to do his best to prevent injury to himself or his fellow employees. Programs to stress this individual responsibility for safety are given repeated emphasis, beginning with the employee's safety orientation the day he is hired, and continuing throughout his employment. Stress is also placed on the fact that the du Pont company has always operated on the basis that the safety of the employee is of the greatest importance, ranking along with quality, production and costs. The basic philosophy is that all personal injuries can and should be prevented. Only when all employees are thoroughly imbued with this philosophy can long terms of injury-free performance be expected and achieved.

By courtesy of Industrial Commission of Ohio's "Monitor." Pictures from E. I. du Pont de Nemours & Co., Inc.

Defect Detector

(from page 22)

centering, as well as intensity and focus, are independently adjustable.

Two quick-disconnect coaxial connectors and a slide switch permit conventional single transducer pulse-echo, double transducer pulse-echo, and double transducer pulse-transmission testing. Also possible are simultaneous testing at two different frequencies, and the comparison of a flaw signal with a known reference signal. When fitted with a single-gate flaw alarm, it will automatically reject materials outside permissible limits.

Pictures by courtesy of Branson Instruments, Inc.

Isolation of Fire Hazards

Any way you look at it, toluol solution is explosive, to say the least. However, many manufacturers of molded plastic products must employ this temperamental liquid; and many are doing it with great success and safety.

One of these concerns is the Hawley Products Co. of St. Charles, Illinois. The firm stores and transfers over 12,000 gallons of the volatile toluol each month.

They store the toluol in a 12,000 gallon tank at a safe distance of about 200 feet from the manufacturing building. A close-coupled vertical turbine pumps the liquid from the storage tank to the two processing or manufacturing areas inside the plant. The turbine is controlled at both processing locations and also at the pump site.

Mounted with the discharge head bolted gas-tight to the hatch, the pump extends to a sump in the bottom of the huge tank. This permits the impellers to be in the solution at all times. It also permits evacuating the tank of liquid completely, should this become necessary.

The pump's 1½ H.P. vertical hollowshaft motor and all controls are explosion-proof. The pump assembly has three-stage 5⅝" bowls of bronze; the column pipe is of red brass; the bell mouth inlet is bronze and the flat screen strainer of brass. Although several other specifications were submitted, this was the one approved by the insurance underwriters.

Picture by courtesy of The Deming Company.

3 Fire Protection Tips

Dual use of a low-lift platform truck as a production tool and a piece of mobile fire fighting equipment has been effected by maintenance and safety personnel at the Yale Materials Handling Division plant in Philadelphia.

Key to the system is a fire fighting unit mounted on a skid. It carries carbon dioxide and dry chemical fire fighting systems as well as a small tank of water and auxiliary hose for connection to local outlets.

In case of emergency, the low lift truck picks up the skid and carries it to the location where it is needed. The truck is able to maneuuver in narrow aisles, low headroom areas and other places where standard fire equipment could not operate.

Picture by courtesy of Yale & Towne Mfg. Co.

Fire Fighting Equipment →

A 30-pound dry chemical extinguisher is being used to put out a hot gasoline and oil blaze during a fire safety drill at Socony Mobil Oil Company's refinery at Trenton, Michigan. The demonstration was staged for refinery employees and a local volunteer fire department. During the tests gasoline and oil were poured on the concrete pad and permitted to burn for several minutes before being attacked with extinguishing equipment.

Picture by courtesy of Walter Kidde & Co., Inc.

← Fire Training of Employees

CONCRETE FLOOR ENAMEL

A new non-toxic isocyanate floor enamel said to offer maximum toughness, flexibility, abrasion and impact resistance has been developed by Pittsburgh Plate Glass Company. The product, to be known as "Pittsburgh Durethane Enamel" for concrete surfaces, is formulated with the durable isocyanate resins and is believed to be the only non-toxic product of this nature developed to date. Exhaustive tests made in heavy-traffic industrial plants, school cafeterias, airplane hangars, etc. gave exceptional results in all applications. Laboratory tests indicate the enamel to be 15 to 20 times tougher than the conventional floor paints and to possess three times the abrasion resistance of all floor coatings tested.

Durethane enamel is a two-component system, a clear liquid and a color component in a choice of tile red, pewter gray or cruiser gray. The components are combined in equal parts just prior to application. The finish may be applied by brush, spray or roller coater. On old floors previous coatings should be removed with a rinse-away paint remover. Two coats of the finish are recommended. The paint dries overnight and can be walked on freely. It attains maximum toughness after several days so should not be subjected to heavy equipment traffic for the first few days.

For further details, use **Key # PM-1** on inquiry card on page 1.

ALL-PURPOSE ALUMINUM SCAFFOLD

Introduction of an "all purpose" aluminum scaffold unit that may be rolled through doorways, and adjusted to work on stairways, is announced by Bil-Jax, Inc. The complete rolling scaffold weighs only 77 lbs., including casters, making it easy for one man to lift, assemble, disassemble, maneuver and transport. The single unit is 6'6" high, 28" wide and 7 feet long. The arm braces permit working over and around objects such as desks and machines. The expanded aluminum work platform may be placed on any rung, and extra ladder sections in 3, 4, 5 and 6 foot lengths may be added to go higher.

For further details, use **Key # PM-2** on inquiry card on page 1.

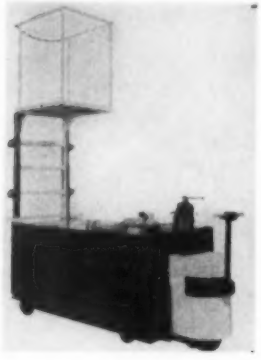
Plant Maintenance Developments

MOBILE WORK-SHOP

The "Shop-Van" is a self-propelled, mobile work-shop, designed for maximum usefulness in maintenance, repair and overhead assembly. This battery-powered unit will transport 2,000 lbs. of tools, materials and equipment, eliminating time-wasting trudging to and from the supply center. Heavily constructed of unitized, welded steel, the Shop-Van comes complete with telescopic work-platform, battery, bench vise, pipe vise, and a large cabinet. One side of the cabinet contains sixteen drawers each with inner sliding tool tray; the other side consists of two sliding-door shelf compartments. Drill presses, bench grinders, etc., can be mounted on the 34″ x 68″ table top.

The telescopic work-platform, which is hand-winch operated, has a raised height of ten feet, lowered height of six feet. Additional height is offered as an option.

The propulsion unit is of the fifth wheel type, with a speed of



2½ MPH., providing excellent maneuverability, so that it can make a complete turn within its own diagonal length. Also furnished in stand-up and sit-down rider models, with speeds of 4–8 MPH. There is a choice of steel, hard plastic or rubber-tired wheels. All models are available without the telescopic work-platform.

For further details, use **Key # PM-3** on inquiry card on page 1.

STEAM CLEANER LIQUID

Fine Organic's new Steam Cleaner, F.O.-287, has been engineered for use in steam cleaning machines. This new viscous liquid quickly performs heavy duty cleaning and degreasing of painted and unpainted ferrous and non-ferrous surfaces. It is recommended for jobs as varied as the removing of heavy deposits from the wheels of fork and hand trucks and lift chains, as well as for lighter soils on such soiled painted surfaces as aircraft. Unlike powdered cleaners, F.O.-287 will not clog steam generator lines. It is used in the same dilutions as powdered products. Available in 5, 30 and 55-gallon containers.

For further details, use **Key # PM-4** on inquiry card on page 1.

AUTOMATIC LADDER LEVELER

A new automatic ladder leveler, field tested for seven years, is now available for use by painters, construction and maintenance crews, and other users of extension or single type ladders. The "Levelit" Ladder Leveler provides safety features for workers placing ladders on uneven levels. The device is fully automatic—to permit setting of ladders on stairs, sloping roofs, or on any uneven surface from 0″ to 27″. Its mechanical design and construction automatically locates upon placement and self-releases automatically upon re-locating the ladder. Constructed of strong, light-weight aluminum, the device may be quickly attached to any length or width, straight or extension type wood ladder and fits many metal ladders.

For further details, use **Key # PM-5** on inquiry card on page 1.

WATER LEAK PLUG

A new waterproof material called "Hydro-Plug," stops leaks in masonry walls or floors—whether the water is gushing through or just trickling. It begins to set as soon as it is mixed (in approximately three minutes). Simply form a cone-shaped plug of the mixed material and ram it into the hole. Hold the plug in place for about five minutes. It can also be used to repair dry holes or cracks with a putty knife or trowel. Or, for fine cracks, it can be mixed to a brushing consistency and applied with a paint brush.

"Hydro-Plug" is a combination of rubber-silicone liquid and specially formulated dry hydraulic cement which are mixed together to make a heavy paste. It is not injurious to hands or skin. It expands during its setting period, and can also be used for sealing joints between pipes and masonry, caulking around windows, repairing tie-wire holes in new foundations, for anchoring of bolts, machinery, fixtures, hooks to concrete and other masonry surfaces, etc.

For further details, use **Key # PM-6** on inquiry card on page 1.

SAFE "ELECTRIC CLEANING"

Cleaning electrical switchboards, control panels, boxes, etc. without the usual power shut-down is just one of the many applications of the "Little Windy Airvac," a powerful, air-operated vacuum cleaner that operates on the Venturi principle and fits any standard air hose. A wide selection of non-conductive, fibre and plastic attachments fit this unusual device for electrical cleaning applications.

The unit, made by M. M. A., Inc., is usable for countless other wet and dry pick-up operations. It can be used in hazardous areas and with many combustible materials. With its non-ferrous castings, there is no striking spark. The absence of any moving parts or electrical connections make it even safer.

For further details, use **Key # PM-7** on inquiry card on page 1.

SANITIZING CLEANER

Apex "Swell" a newly developed general purpose industrial cleaning compound sanitizes as it cleans. The product is a readily soluble, mildly alkaline, powdered-form compostion having excellent detergency with built-in bactericidal agents. Recommended for cleaning floors and floor tiling, painted walls and porcelain tiles. The free rinsing properties of its 100% active ingredients permits its use in hard water areas. Available from Apex Alkali Products Co.

For further details, use **Key # PM-8** on inquiry card on page 1.

ALUMINUM-ASPHALT ROOF COATINGS

Reducing indoor temperatures by reflecting as much of the sun's heat rays as possible is just about as important as protecting roof surfaces. Two new products, RIW Asphalume and RIW Asbestalume, have been introduced to fulfill both of these functions. These coatings reflect up to 71% of the sun's heat and reduce under-roof temperatures as much as 15 degrees by the formation of a permanent metallized shield composed of pure aluminum flakes which have been added to a specially-prepared as-

phalt base. This efficient combination provides long-term protection against the severest weather conditions and extremes of temperatures. RIW Asphalume enhances roof surfaces with its highly polished finish. For extra heavy-duty service where a shiny roof exterior is not important, RIW Asbestalume is recommended because of its reinforcement of asbestos fibers. Moisture-and-corrosion resistant, the products can be easily applied with brush or squeegee. Ready-mixed, ready-to-use, they require no thinning or heating and can be used on water towers, storage tanks, fabric-topped vehicles, exterior walls of cement or cinder block construction, downspouts, gutters, etc., as well as roofs.

For further details, use **Key # PM-9** on inquiry card on page 1.

NEOPRENE MAINTENANCE COATING

A corrosion inhibiting, liquid Neoprene protective coating with a "built-in" primer has been announced by the coatings division of Charleston Rubber Company. It has multiple uses in industrial, marine, transportation equipment, agricultural and other maintenance. This new combination primer-coater, known as "Charcote CIC-21," makes possible substantial savings of material and labor costs. Other advantages claimed are ease and flexibility of application, long lasting resistance to weathering, chemical fumes, salt spray and corrosion creep; also the resistance of its hard, yet flexible film to impact and abrasion.

CIC-21 contains five ingredients selected for their strong corrosion inhibiting nature, including red lead. The coating will adhere to steel, bronze, aluminum, stainless steel and galvanized iron, concrete, wood, rubber, canvas and other materials.

For further details, use **Key # PM-10** on inquiry card on page 1.

SAFETY LADDERS

"Trouble-Saver" safety ladders, from The Patent Scaffolding Co., Inc. combine the safety and strength of steel construction with efficiency of a rolling unit. These

new ladders save time, labor and effort in fixed height work in a wide range of applications, the company reports.

The ladders are made in 20″ and 30″ widths in a complete range of sizes, from one to five steps without handrails and from two to 12 steps with handrails. Design features include: all-welded construction, smooth rolling casters which lock when user steps on ladder, flared base for greater stability, extra braces on taller ladders, expanded metal treads of improved design, and curved front rails on units without guard rails, making ladders easier to grasp for rolling.

For further details, use **Key # PM-25** on inquiry card on page 1.

VERSATILE PAINT COLORANTS

A new line of concentrated colorants, that may be used to tint interior or exterior types of emulsion paints, oil base paints, alkyd flats and enamels and other special air-drying coatings, has been developed by the Pittsburgh Plate Glass Company. Designed primarily for painter use, the new colorants will be marketed as "Pittsburgh Universal Tinting Colors."

There are fifteen colors in the line which are said to be capable of producing virtually any color in any desired finish. They are not restricted to use with tinting bases. Colors will be packaged in quart and half-pint friction top cans.

For further details, use **Key # PM-11** on inquiry card on page 1.

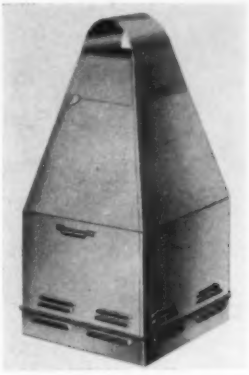
ALUMINIZED COATING

A new aluminized coating in a variety of non-fading colors for decorating and protecting masonry, wood and metal is announced by Speco, Inc. Known as "Metalsurf," it covers either previously-painted or bare porous surfaces in one application with an attractive metallized finish. Formulated with special aluminum pigment and long fibre asbestos, it also fills hairline cracks and other surface imperfections.

Metalsurf is recommended for use on cement and cinder blocks, concrete, brick, stone, all types of masonry, stucco, unglazed tile, wood, metal and wallboard, etc.

Applied indoors or out, it is said to resist damage from oil, grease, industrial fumes, mild acids. It won't chip, peel, crack, blister or fade when subjected to severe climatic conditions. Can be used on masonry walls above or below grade to seal out moisture. Available in eight colors.

For further details, use **Key # PM-12** on inquiry card on page 1.



SIX-BUSHEL INCINERATOR

A new low-cost, six-bushel outdoor incinerator is announced by Alsto Company. The new unit is shipped assembled and requires no installation cost or auxiliary fuel for a wide range of industrial, commercial, and institutional organizations. It will burn waste paper, packing, cartons, sweepings, food scraps, rags—burnable refuse of all kinds to fine ash in any weather. It requires no watching. Scientific draft control burns damp, green, or dry refuse without fire danger and nuisance of burning, blowing bits of paper. The unit minimizes smoke and smell. It is constructed of sturdy, aluminized steel and has a hinged hood and a big 14" square opening at top for easy loading. It stands 53 inches high by 24 inches square at the base. The interior has double-wall construction and replaceable inner panels.

For further details, use **Key # PM-13** on inquiry card on page 1.

PROTECT THIS MAN'S HEARING-

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Let him try a sample

SOUND PROTECTION

Before any one of your employees suffers loss of hearing from chipping, riveting, forging, punch pressing etc., or any abnormally loud noise, protect him with Straightaway, muff type, Sound Protectors.

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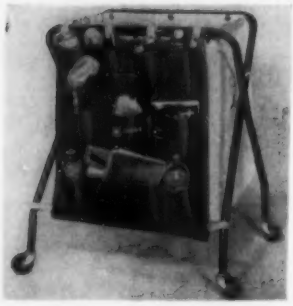
(Use Key # G-13 on Inquiry Card on page 1)



WASTE & CLEANING CART

The Caddy, an efficient carry-all for maintenance supplies, is the newest accessory for the Waste Mobile, a trash collecting unit manufactured by Walton-March. The sturdy blue fabric carrier has three rows of roomy pockets to accommodate polishes, cleaners, cloths, brushes and other maintenance tools—even space for gallon containers. It's designed to fit both the four and six bushel Waste Mobiles.

For further details, use **Key # PM-14** on inquiry card on page 1.

UPRIGHT LADDER FEATURES SAFETY STEPS

A new flat step marine ladder specially designed for safety and to withstand hard usage is announced by The Cleveland Ladder Co., Inc. The ladder is constructed with side rails of Sitka Spruce or West Coast Hemlock, reinforced with aircraft cables, hand rails of 1½" diameter Maple, Linseed oil treated, strong steel boots, all metal parts plated and with wide aluminum safety tread steps.

The new steps are a one-piece, raised serrated stamping that forms a strong grated surface. It has a 55% open area which will not allow snow, sleet or ice to build up and the tooth-like projections assure a firm non-slip surface for boarding. "Cle-Lad" super safety marine boarding ladders are made to assure maximum safety and long hard usage.

For further details, use **Key # PM-15** on inquiry card on page 1.

VERSATILE MAGNESIUM SCAFFOLD

A new lightweight scaffolding unit made of magnesium can be assembled and carried by one man. It can withstand a maximum load of 600 pounds of distributed weight, according to the manufacturer, White Metal Rolling & Stamping Corporation. Flanged tubular sections and guard rails interlock on a sleeve tube for durable "pyramiding" construction.

The basic unit provides a platform nine feet high and seven and one-half feet long and weighs 62 pounds. It consists of two six-foot end sections, two three-foot end sections, four cross braces, two outriggers, one guard rail with two posts, and a combination platform plank-ladder which can be used as shown in assembling the other pieces. End sections can be added up to a total height of 24 feet. Additional units can be connected laterally. The six-foot end sections are equipped with notched, hard-rubber padded feet which are adjustable for uneven levels.

For further details, use **Key #-PM-16** on inquiry card on page 1.

GERMICIDAL CLEANER

A potent weapon in the war against infection, made by the Walter G. Legge Co., is "Elimstaph #2," a new germicidal cleaner that kills staphylococcus, enteric and respiratory pathogens and fungi on contact. According to a U. S. Testing Company report, the cleaner has the exceptionally high phenol coefficient of 33. It kills quickly, actually penetrating the wall of the microorganism and destroying it from the inside. A residual type product, it loses none of its efficiency during kill. It functions at full strength as long as it remains on the floor or other surface to which it has been applied.

Diluted one ounce per gallon of water, "Elimstaph #2" is applied with a mop. It does a thorough cleaning job on floors of all compositions, rigid as well as resilient. A single application cleans, disinfects and deodorizes.

For further details, use **Key # PM-17** on inquiry card on page 1.

PIPE SEALANT TAPE

A chemically-inert tape, designed to seal and to permanently lubricate pipe joints, has been announced by Minnesota Mining and Manufacturing Co. Called "Scotch" brand Pipe Sealant Tape, No. 547, this unfused film tape, available in 3 and 4 mil calipers, can be applied in seconds and conforms to all types of pipe threads and fittings.

Made with a TFE-fluorocarbon resin, it can withstand processing temperatures from the liquid-oxygen range through that of super-heated steam. It is not affected by oil traces or other lubricants in the steam line.

Although non-adhesive, the tape is sufficiently cohesive to stick to

its own glossy surface. The tape's anti-sticking characteristics lubricate joints so they can be loosened and detached years after the threads are taped. This white, pliable tape is available in convenient 36 yard rolls in ¼" to 8" widths.

For further details, use **Key # PM-18** on inquiry card on page 1.

RUST PREVENTIVE

Rust-Cure is the Monroe Company's answer to rust. Without scraping, wire brushing or sandblasting. Rust-Cure goes on right over the rust—by brush, spray or dip. It penetrates through rust particles and has a natural affinity to the metal surface beneath the rust. It is ready to apply by brush—ordinarily requires thinning for spray application. It's available clear or in colors—red, aluminum, green, light gray and black—to eliminate loss from rust and protect new surfaces before rust starts.

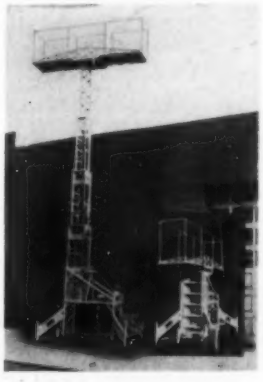
For further details, use **Key # PM-19** on inquiry card on page 1.

AUTOMATIC MAINTENANCE SCAFFOLDS

Economy Engineering Co., announces that the "Wind-O-Washer," the first standard automatic outdoor building maintenance scaffolding, is now available in a wide variety of roof-top mountings. The unit ascends and descends along the side of a building, permitting maintenance personnel to wash windows, paint, clean, glaze or perform any other outdoor maintenance function. Motion of the unit is controlled by the operator from the platform.

Power for vertical and horizontal travel is from a vehicle which is mounted atop the building's roof. This roof car is normally track-mounted. The roof car can be removed from sight, if desired, by means of a turntable, or by using a curved track arrangement. The roof car can also be designed to operate on a concrete pad, manually steered, either power or manually propelled.

For further details, use **Key # PM-20** on inquiry card on page 1.



ALL-PURPOSE SCAFFOLD

Atlas Industrial Corp., announces the introduction of the new "All-Purpose Scaffold" for spot and area maintenance. It comes completely ready for work—no erection required, no loose parts. This scaffold is furnished with a small platform railing for spot maintenance, and a large platform and railing for area maintenance (as shown in photo). It is a bolt-on platform with guard rails removable for easy storage.

It is of all-welded steel construction, and is equipped with four swivel casters for turns in close quarters. It has outriggers for stability. The platform may be built to meet individual requirements and can be raised to any desired height.

For further details, use **Key # PM-21** on inquiry card on page 1.

ALL-NEW PLASTIC SALT DISPENSERS

The popular, regulated and coated HAV-a-LIFT Salt and Salt & Dextrose Tablets are now available in a completely NEW All-Plastic Disposable Dispenser.

Write today for prices and sizes on these NEW Disposable Units and the name and address of the Distributor nearest you.

A. E. Halperin Co., Inc.
75 NORTHAMPTON ST.
BOSTON 18, MASS.

(Use Key # G-14 on Inquiry Card on page 1)

THE POSITIVE LADDER SAFETY DEVICE LOCKS-IN-A-NOTCH!

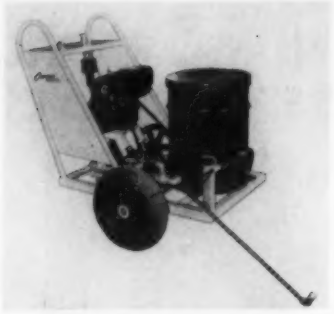
Prevents death and injuries from falling. If climber starts to fall, device locks in a deep notch on carrier rail and limits fall to approximately 6 inches —distance between notches.

LOCKS AUTOMATICALLY and INSTANTLY—HOLDS SECURELY

Will catch and hold workman if he starts to fall, even if unconscious. Cannot slip on down ladder. Requires no attention from climber; he climbs in normal manner. Inexpensive. Easy to install; 3 men can clamp it to ordinary ladder in few hours. Clamps to any rung ladder, peg ladder, pole or framework. No welding or cutting. Notched rail hot-dipped galvanized. Entire equipment rust and corrosion proof. Can be kept free of ice by applying heat inside the carrier rail. In use approx. 11 years. Approved by Safety Engineers and Government Agencies throughout country. Patented. Manufactured only by

SAFETY TOWER LADDER CO.
1024 Burbank Blvd., P.O. Box 1052
BURBANK, CALIFORNIA

(Use Key # G-15 on Inquiry Card on page 1)



CONCRETE CURING SPRAYER

A new portable spraying machine, designed to spray concrete curing membrane on freshly poured concrete, has been developed by Champion Manufacturing Company. The new unit is designed for use on short runs of pavement, parking areas, and for side edge spraying after forms are removed. It has a 15 gallon tank.

It can also be used for oiling of forms before use. The unit comes equipped with the necessary attachments for various kinds of spraying. A simple on-off switch, pressure controls and all other major controls are located on the dashboard. Designed to require minimum maintenance, the unit has all parts located to be easily accessible and replaceable.

For further details, use **Key # PM-22** on inquiry card on page 1.

GERMICIDAL BOWL CLEANER

"Bol-Tabs," the toilet bowl cleaner in dissolving tablet form, has added another benefit. The company now reports powerful 30 seconds kill-time against "Staph" (staphylococcus aureus). This product is said to kill germs 20 times faster than phenol and only one-third the amount is needed. Introduced initially as a safer, more convenient and economical method of maintaining toilet fixtures, the product is said to loosen rust and lime stains, while cleaning and deodorizing. "Bol-Tabs" will not harm porcelain enamel and will eliminate spillage, waste, and acid accidents. Manufactured by Horizon Industries.

For further details, use **Key # PM-23** on inquiry card on page 1.

GLASS FIBRE ROOF CEMENT

Protex Fibre Glass, a new roof repair cement for filling and repairing leaks or breaks in roofs, has just been announced by The Garland Co. A highly adhesive water-proofing compound, the product can be applied right on a wet roof. The material flows into leaks and cracks, makes them water-tight. On seams it prevents leaks from developing where nails "work up." Highly adhesive, it holds edges of felts firmly in place on flashings around firewalls, parapets, and sky lights. Can also be used as a lining for wooden gutters or troughs. The manufacturer states that the glass fibres in Protex don't absorb roofing oils so that roofs stay "live" and working.

For further details, use **Key # PM-24** on inquiry card on page 1.

Spot Accidents
(from page 28)

sisted of the workers' failure to protect themselves against physical hazards of the workplace. The hazard frequently was not created by the person who was injured, but in most instances, it was one which should have been apparent and which could have been avoided through the exercise of reasonable attention and judgment.

The failure to observe and avoid tripping hazards was a very common cause of falls not only on the regular working surfaces but also on elevated surfaces where the prospect of serious injury should have stimulated greater attention. **Poor housekeeping, inadequate maintenance of working surfaces, and improperly placed materials** were contributing causes in many of these accidents.

Most of the accidents attributed to **inattention to surroundings** were those in which the injured person bumped into some stationary object in the working area and was injured either by the force of his contact or was struck by falling objects dislodged by his contact. Often these were instances in which a person turned sharply and struck a pile of material, a fabrication, a machine, or a parked industrial truck. Congestion of the workplace and improperly placed materials were frequently contributory causes in these accidents. In other fairly common instances, persons working in confined spaces either bumped into obstructions while moving about or had their own tools deflected against them when the tools struck obstructions.

The most serious accidents in this general group, however, were those in which the injured employee exposed himself to contact with moving materials or equipment. These unsafe acts included **taking a position under a suspended load, standing between a swinging load and a fixed object, standing close to moving vehicles or moving machines, working under unsecured fabrications, and standing in front of rolling or sliding objects.** In many of these instances, the employee's unfortunate choice of action might have been avoided by more adequate supervisory planning and control of the operation.

USING UNSAFE EQUIPMENT OR EQUIPMENT UNSAFELY: In a high proportion of these cases, the specific unsafe act was that of **not maintaining a secure hold on objects being handled.** In many instances, the material simply slipped from the worker's hands

and fell on his toes. In other instances, insecurely held tools went out of control and deflected against the worker's body. Few of the accidents resulting from these unsafe acts were serious, but in the aggregate they were responsible for a considerable volume of lost time. Wider use of safety shoes undoubtedly would have reduced the volume of injuries resulting from these accidents.

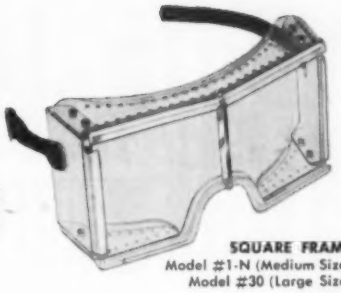
A related unsafe act, **taking a wrong hold on objects,** was responsible for a smaller number of accidents—but the resulting injuries tended to be more serious. These were primarily cases in which workers grasped objects which they were moving in such a way that their fingers were caught when they set the objects down, or were mashed against other objects in the course of the operation.

The unsafe acts of **using defective equipment** (i.e., when there was a choice) or of **using equipment for purposes other than that for which it was intended** were not common. It seems significant, however, that the use of handtools was involved in most of these cases.

UNSAFE LOADING AND PLACING: The unsafe acts designated as unsafe loading consisted specifically of cases in which the objects being moved were too heavy, bulky, or awkward in shape for the number of persons doing the lifting. All of the injuries resulting from this group of accidents were strains or sprains, mostly affecting the back.

"Do you have the same thing in an elevator shoe?"

ROUND FRAME
Model #7 (Medium Size)
Model #27 (Large Size)



SQUARE FRAME
Model #1-N (Medium Size)
Model #30 (Large Size)

Rigid Frame COVER GOGGLES

Unimpeded Side Vision. Crystal clear frames permit unimpeded vision from both sides as well as from under and over the eyes.

With their shatter-resistant, optically-correct IMPAX Lenses, these goggles permit excellent vision in all directions and provide maximum heavy impact protection from all angles.

Interchangeable Lenses reduce costs and cut down goggle inventory needs.

All-Molded Construction provides extra strength . . . resists breakage at all points.

Lock Bar holds lens firmly. Has integral annealed end permitting easy removal for lens replacement.

Black or Green Frames are also available.

For details, see your authorized EYE SAVERS supplier or write direct.

Quality Eye Protective Equipment *Made by the Leaders in Plastics*

WATCHEMOKET OPTICAL CO., INC.

232 West Exchange St. PROVIDENCE 3, R. I. *In Canada: Levitt-Safety Limited, Toronto 10, Montreal 26, Winnipeg.*
(For details, use Key # G-16 on card on page 1)

Unsafe placing consisted primarily of placing objects in unstable positions or piles from which they ultimately fell, often inflicting injuries on other persons. This group did not include cases of improper placing (i.e., in terms of position) nor did it include cases in which materials were properly placed but inadequately secured against sliding or falling.

OTHER UNSAFE ACTS: Supplementing the major pattern, there was a wide range of somewhat less common unsafe acts which in the aggregate were responsible for a substantial volume of injuries. Because these may be somewhat of a rare occurrence in any individual establishment, their importance may be overlooked and the steps necessary for their elimination may not be taken. The industrywide summaries, however, indicate that several varieties of these "less common" unsafe acts do occur often enough to warrant special preventative action.

In particular, the failure to secure materials and equipment against unexpected movement is responsible for a considerable number of injury-producing accidents. In an appreciable number of cases, metal stock and assemblies had slid or toppled onto or against people who were working with them simply because the articles had been precariously placed and unsecured. Similarly, in other instances, workers had been struck by unattended industrial trucks which had been parked on slopes without being blocked against movement.

Another rather common unsafe practice deserving attention is the failure to make use of available personal protective equipment, particularly goggles. The failure to use goggles which had been provided was directly responsible for three of the reported cases in which workers lost the sight of an eye and for a considerable number of less serious injuries inflicted by flying particles or by welding radiations.

Charts from Bureau of Labor Statistics, U. S. Dept. of Labor.

Revised Ladder Code

A new revision of the American Standard Safety Code for Portable Wood Ladders has been approved and published by the American Standards Association. First issued in 1923, the code offers a guide to the construction, care and safe use of portable wood ladders.

The fourth revision just published brings the code up to date and improves its effectiveness by clarifying some points about which uncertainties existed in the past, according to Alan D. Freas, chairman of ASA Subcommittee A14.1 on Portable Wood Ladders.

The intent of the code in relation to deviations from the minimum dimensions specified for ladder parts has been clarified in the revision.

In the construction requirements, the new edition provides for the use of angle braces at the ends of longer steps of stepladders. Additional methods of bracing the back sections of stepladders have been described, and measures to reduce the possibility of splitting the back leg at the hinge pin have been added.

A considerable number of changes have been made in the revision to clarify the wording and the intent of the code and to modify material and construction requirements.

The American Standard Safety Code for Portable Wood Ladders is sponsored by the American Ladder Institute, the American Society of Safety Engineers, and the National Association of Mutual Casualty Companies.

In addition to offering construction details for all types of wood ladders, the code is suitable as a guide to state authorities and other regulatory bodies in the formulation of laws and regulations. It is also recommended as a basis for purchasing requirements, plant manuals, safety instructions, and personnel training. An entire section of the code contains recommendations for the maintenance, safe use, and storage of portable wood ladders.

Copies of the American Standard Safety Code for Portable Wood Ladders (A14.1–1959) are available at $1.50 each from the American Standards Association, Dept. PR 68, 70 East 45th Street, New York 17, N. Y.

Loss Prevention Guide

Specific up-to-date methods and equipment for avoiding damage to industrial plants and processes are set forth in how-to-do-it fashion in this just-published, 864 page manual. It is a comprehensive handbook of modern fundamentals, procedures, and data for protecting factories and processes against destruction or damage by fire, explosion, lightning, wind and earthquake.

The book gives practical, definite recommendations for safe construction; automatic sprinkler systems and water supplies; safeguards for processes involving flammable liquids or gases; protection of high storage values; elimination and control of ignition sources; anchoring roofs against wind; earthquake protection; and other preventive and protective measures.

Included in this informative volume are sections on the uses of all types of portable fire extinguishers as well as chapters on both general and specialized types of automatic extinguishing systems. Among the many specific fire hazards covered are: air-conditioning systems; transformers; static electricity; industrial heating equipment and ovens; liquefied petroleum gas; dip tanks; metal cleaning; dry cleaning; distilleries; plastics; explosives; industrial trucks; atomic energy; textiles; paper manufacturing; glass plants; warehousing; lumber and coal storage.

Latest tested equipment used by leading industries to prevent disastrous losses are described, plus many new methods never before generally revealed. The book has hundreds of engineering tables and how-to diagrams.

The 74 chapters form a master loss-prevention guide for the use of industrial, insurance, and plant engineers; architects; managers; maintenance and protection departments. It gives detailed help on planning protection in new plants; installing hazardous processes; and carrying out improved protection programs in existing plants.

The book, priced at $20, is the product of the Factory Mutual Engineering Division, a specialized organization for helping plants achieve fire and explosion safety through inspections, engineering, and research. The Division is maintained by a group of eight factory mutual insurance companies.

Further details on the Handbook of Industrial Loss Prevention are available from McGraw-Hill's Book Information Service, 327 W. 41st St., New York 36, N. Y.

BRI Issues New Book On Resilient Flooring

A new publication of the Building Research Institute, "Installation and Maintenance of Resilient Smooth-Surface Flooring," contains some excellent tips from top men in the business on both the installation and the maintenance of all the various types of resilient flooring on the market today.

Among the sections of the book of major interest to architects, engineers, flooring contractors, builders and building owners and operators is the report on BRI's

pre-conference survey of flooring problems throughout the country, and the recommendations of the experts on what to do about them. Special types of adhesives for various tiles and sheet materials are also discussed, as well as the comparative wearability, colorfastness, comfort and other characteristics of the different tiles.

A unique feature is a chart, developed by BRI with the cooperation of the major manufacturers of resilient flooring in the U. S. This chart compares physical properties, standard dimensions, installed cost per square foot, and the use level at which each material may perform successfully, whether on, above or below grade.

In all, this Building Research Institute document contains 14 individual reports, two on-the-spot workshop discussion panels, and three appendix sections related to the survey questionnaire and the replies thereto. Priced at $5.00 per copy, the 145-page illustrated book, Publication No. 597, may be obtained from Building Research Institute, 2101 Constitution Ave., Washington 25, D. C.

Second Edition of Petroleum Text

The publication of a Second Edition of the widely known textbook, "Safety in Petroleum Refining and Related Industries," was announced recently by Mr. Fred O. Clark, president of John G. Simmonds and Co., Inc., Oil Insurance Underwriters of New York City. This new edition contains a large amount of additional information on hazards and protection against them, which has been brought out by industry experience since the first edition was published in 1950.

George Armistead, Jr., consulting engineer of Washington, D. C., who has for many years been engaged in petroleum and chemical plant engineering and is active throughout industry on hazard reduction and analysis of accidents and fires, prepared both the first and second editions for the Simmonds organization.

This publication represents a continuation of John G. Simmonds and Co., Inc. in providing industry with a comprehensive and up-to-date textbook in the field of accident and fire prevention in the petroleum refining, petrochemical, synthetic rubber, chemical and related industries. As in the past, emphasis in this publication is upon prevention of accidents rather than remedies for their results, since this is the channel through which the burden of losses to industry may be relieved.

The Second Edition contains approximately 500 pages and includes over 250 photographs, drawings and diagrams. New material includes extensive treatment of detonative type explosions; oxygen plant safety; jet fuel handling; tank collapse, overflow and explosion; and brittle faliure, with extensive information on fires and explosions since the last publication in 1950. Copies can be secured through John G. Simmonds and Co., Inc., 111 John Street, New York 38, New York.

Agricultural Chemicals

The second edition of "Hanna's Handbook of Agricultural Chemicals," a 450-page handbook containing descriptions of over 1,000 commercial chemicals and miscellaneous items used in the agricultural industry, is now off the press, according to Lester W. Hanna, author of the handbook and Research Entomologist and Agricultural Technician. The pocket-size handbook gives the various common and chemical names and numerical designation of: fertilizers, fumigants, fungicides, weed killers, insecticides, livestock chemicals, rodenticides, and miscellaneous materials. Their chemical and physical properties, formulations and uses, toxicity, if any and antidotes in case of poisoning are covered. Other features include: official antidotes, emergency treatments, drugs and first aid, trivial code of entomological terms, U. S. D. A. pesticide registrations, Food and Drug Administration residue tolerances, safety practices, chemical compatibility, formulae, conversions and tables.

The price is $5.95 per copy which can be obtained from Lester W. Hanna, Route 1, Box 210, Forest Grove, Oregon, U.S.A.

Construction Handbook

The first book ever written on inspecting, testing and supervising the construction of buildings, "Field Inspection of Building Construction," by Thomas H. McKaig, has just been published by F. W. Dodge Corporation, New York. The material presented in this new book is of a completely practical nature, and designed for day-to-day use by architects, engineers, contractors and field inspectors. It is not a textbook, and does not delve into theory.

Thomas H. McKaig is both an architect and an engineer and has for 35 years headed his own active consulting firm in Buffalo, New York. He is Chairman of the New York State Board of Examiners for Professional Engineers and Land Surveyors. As an author he is well known to architects and engineers through his best-selling book, "Applied Structural Design of Buildings," also published by Dodge.

McKaig's presentation of this material closely follows the sequence of work as it is normally met in building jobs, and is of great value in defining the responsibilities of each party in the complicated owner-architect-engineer-contractor-subcontractor relationship.

The first chapter of the book is a general discussion of the field inspector's job, and covers coordinating work by the various trades, defining the thin line between over- and under-inspection, keeping proper records, and other problems relative to the job of field inspection.

In five subsequent chapters, McKaig defines the duties and responsibilities of the inspector at each stage of construction: *The Preliminary Stage, The Foundation Stage, The Structural Framing Stage, The Intermediate,* and *The Finishing Stage.*

Sample documents and checklists are incorporated and the appendices include a listing of 86 valuable reference sources with their addresses. $9.35, 337 pages. For further information, contact: Ann L. Bronaugh, Publicity Director, Dodge Books, 119 W. 40th St., N. Y. 18, N. Y.

R. K. Hyde, manager, advertising and publicity, *AMERICAN DISTRICT TELEGRAPH CO.*, and editor of "The ADT Transmitter," is retiring July 1, after thirty-eight years with the organization. *J. J. Caffrey*, manager, sales promotion, has been named manager, sales promotion and advertising.

Mr. Hyde joined ADT in 1921 as a sales engineer. He was assigned to New Haven for a short time, then served in Boston until 1926, when he was transferred to Executive Sales, New York. In 1929 he became editor of the newly created ADT Transmitter. Five years later he was made advertising manager.

Mr. Caffrey joined the ADT sales department in 1951. He has been manager, sales promotion since 1956.

THE GENERAL RADIO CO., one of the country's foremost manufacturers of electronic measuring equipment, has moved its headquarters and personnel from Cambridge to its new offices in West Concord, Massachusetts. As the part of a long-range plan, the Company purchased 80 acres of land in Concord in 1948, on which the first of the present buildings for manufacture were built in 1952. The facilities completed this year bring total work space in the modern buildings to well over a quarter of a million square feet. General Radio also maintains District Sales Offices strategically situated in the United States and Canada.

FIRE BOSS, INC., a firm engaged in the manufacture and fabrication of self-contained portable fire fighting equipment, has set up headquarters in Fort Worth, Texas. The firm, located at 4117-B W. Vickery, was founded in Odessa, Texas, two years ago. The move to its new 2400-square-foot quarters in Fort Worth was designed to more centrally locate the firm in the state and move it nearer its sources of supply.

The appointments of three exclusive sales and service representatives have been announced by *LEWIS-SHEPARD PRODUCTS, INC.* for their electric fork lift trucks and other materials handling equipment. The appointments are: *John B. Clifford* for the El Paso, Texas, area (John B. Clifford Material Handling Equipment Co., P.O. Box 900, El Paso, Tex.); *James A. Melville* in the Pittsburgh, Pa., area (Melville Equipment Co., 3147 Library Rd., Pittsburgh 34, Pa.); and *Charles M. Bergen* for the Phoenix, Ariz., area (3821 W. 38th Ave., Phoenix, Ariz.).

Richard Bennett has been named regional sales manager for the Chicago area for *TORIT MFG. CO.*, Frank Chase, vice president—sales, has announced. Bennett will supervise sales activities for Torit's industrial dust collectors and associated equipment in Chicago and its neighboring industrial area. The *E. A. Davenport* organization, 1559 W. 83rd Street, Chicago, will continue as manufacturers' representatives for Torit, Chase said. The new position is to provide additional specialized field engineering services in the area.

Robert E. Boak has joined *WALTER KIDDE & CO., INC.* and will serve as Manager of Wholesale Sales for the company's Industrial & Marine Division which markets all types of fire extinguishing equipment. Prior to joining Kidde, Boak was responsible for sales of Wood Conversion Co. products in the Cleveland District.

Tying together several product businesses to better serve the industrial communications market, *GENERAL ELECTRIC COMPANY* has combined its Technical Products Department of Syracuse, N. Y., and its Communication Products Department of Lynchburg, Va. in a single communications organization. The consolidated operation will be known as General Electric Communication Products Department, with *Harrison Van Aken* as general manager. Headquarters will be in Lynchburg and plants will be located in both cities. The new organization will make closed circuit television, two-way radio units and equipment for the broad field of communication and information handling.

R. D. WERNER CO., INC., manufacturer of aluminum ladders, stages, and scaffolding, has announced that its New York Sales and Advertising Offices have been transferred to the firm's plant location at Greenville, Pennsylvania. Four of the executives formerly headquartered at the firm's New York address, 295 Fifth Avenue, now are located in the Greenville offices. They are *Arthur W. Sellers*, Vice President, Sales; *G. Patrick Bingham*, Manager, Sink Frame Division; *William B. Caldwell*, Manager, Metal Moulding Division; and *William H. Peters*, Manager, Ladder Division. The company's scaffolding division, Aluminum Safety Products, has also been moved to the Pennsylvania site. The new address of R. D. Werner Co., Inc., is: P.O. Box 580, Greenville, Pennsylvania.

Conney Products Company, Inc., of Fond du Lac, Wisconsin has been named as the distributor for the complete line of industrial glove products manufactured by the *PIONEER RUBBER COMPANY*, President *J. H. Gibson* of Pioneer has announced. The new distributor, at 174 West Division St., Fond du Lac, will serve the four states, Wisconsin, Minnesota, Illinois and Indiana.

George E. Knipe has been appointed Manager of Industrial Sales for the *SCRANTON CELLOMATIC BATTERY CORP.*, Archbald, Pa. Previously Mr. Knipe was associated with the Westinghouse Electric Corporation in various sales executive capacities, and most recently as a WESCO Branch Manager.

George Heard

George Heard is the new president of *SAFETY FIRST SUPPLY COMPANY*, Pittsburgh, manufacturers and distributors of industrial safety equipment. He succeeds George S. Shull, who has been named chairman of the board after serving as president since 1923.

Also elected to new positions are: *Davis E. Houston*, assistant treasurer, who has been named vice president and general manager; and *Philip A. Lascher*, acting sales manager, who has been promoted to vice president-sales.

Appointment of *William B. Calhoun, Jr.*, as manager of automotive sales for *PITTSBURGH PLATE GLASS COMPANY'S Ditzler Color Division* in De-

troit, Michigan, has been announced by *Howard J. Mather*, general manager of industrial finishes and plastics for the firm's paint division. Prior to his appointment, Mr. Calhoun had served as manager of industrial sales for Houston, Texas, paint factory since 1953.

UNIVERSAL MFG. CORP. has announced the election of *Robert L. Carbeau* as president. He succeds *J. A. Kirkpatrick* who recently resigned from the scaffolding manufacturing corporation. Mr. Carbeau has been employed by the company since 1950 and has been manager of its Pittsburgh office, assistant to the president, and most recently served as Vice President of Sales and Finance.

Appointment of *Martin B. Jaeger* to the newly created post of advertising manager for *KOEHRING CO.*, was recently announced by E. B. Hill, vice president-marketing. The new position carries responsibility for directing the product advertising and publicity programs for all Koehring divisions and subsidiaries. *E. J. Goes*, publicity manager for Koehring, will continue in that position.

DELTA FIRE & SAFETY, INC., of Lafayette, Louisiana, has been appointed a stocking distributor for Pacific Mercury electric plants and flasher warning lights. Well-known distributors of fire and safety equipment, Delta will maintain a complete parts and service department, according to manager *W. F. Dunlap*.

KLEMP INTERNATIONAL, a new division of the Klemp Metal Grating Corporation, has been established to handle all aspects of Klemp's International-Foreign trade. The new division will be located at 1379 N. North Branch Street, Chicago.

New Atlanta sales and service facilities have been opened by *WALTER KIDDE & CO., INC.* The new building is located at 1882 Marietta Boulevard, N. W.

The modern one-story, red brick structure has loading docks for two trucks, 4,000 square feet of warehouse area, and 800 square feet devoted to service facilities. The remainder of the building is occupied by offices for the Southeastern Regional headquarters of Kidde's Industrial and Marine Division. Complete service facilities permit the repair, recharge, and hydrostatic testing of high pressure cylinders and extinguishers. In charge of the operation is *W. K. Winstead*, District Manager.

James A. Main has been named to manage the newly aligned Industrial Division of *THE FLINTKOTE CO.* The new Division will handle the sale of products for the automotive, railway, paving and industrial products for the building industry—those products which are normally sold in bulk quantities and which are distributed through industrial converters, contractors and industrial distributors.

F. E. Diefendorf has been appointed manager of hospital bed sales for the *AMERICAN METAL PRODUCTS CO.*, it was announced by *E. Wright Yount*, vice president in charge of sales. Diefendorf will supervise sales of AMP's new all-electric hospital bed which AMP developed with the cooperation of engineers, nurses and technicians at the University of Michigan Medical Center.

Safety Appointments

The appointment of a staff director of industrial relations for the Bridgeport Brass company has been announced by *Joseph P. McNamara*, vice president, personnel. Named to this position is *Clarence E. Wynn*, formerly industrial relations director at the Company's Indianapolis (Ind.) plant. Mr. Wynn will be in charge of employee benefits, labor relations and safety programs for all plants of the Bridgeport Brass company.

Mr. McNamara also announced that a new post, that of staff director of accident prevention, has been established in the department of Industrial Relations and *Donald E. Cogswell*, formerly cost reduction supervisor for the Company's Housatonic plant in Bridgeport, has been named to this position. Mr. Cogswell will be in charge of physical demands analysis, industrial hygiene, and safety equipment and practices for all of the Company's plants.

Radiation Hazards

(from page 18)

different conditions and power output. Specific controls would be out of proportion for hazards involved with another type of radar.

In conclusion, it is believed that repeated exposure to radar waves while observing proper precaution does not lead to any cumulative or chronic effects on the body. This seems to be proven by the lack of any evidence showing that anyone has been seriously injured by working with radar equipment. A few reports have been published in newspapers and magazines in past years concerning alleged injury, but it is the opinion of most medical scientists that the reported disorders were not caused by radar. This does not imply that there is no potential risk or hazard associated with microwaves, however. To guarantee the safety of persons who work with radar, additional and extensive medical research should be provided. In the meantime, all radar equipment should be treated with full respect and in accordance with the necessary hazards control information.

Presented before the Pacific Northwest Section, American Industrial Hygiene Association, Annual Meeting, Seattle, Washington.

Picture: Official U. S. Navy Photo.

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the future shows

Minneapolis, Minn. *August 13–15*

Twelfth Annual Convention of the International Rescue and First Aid Association (Pick-Nicollet Hotel). Max L. Spray, Executive Director, IRFAA, 101 North Alfred St., Alexandria, Va.

Chicago, Ill. *September 21–25*

Fourteenth Annual Instrument-Automation Conference & Exhibit, (International Amphitheatre). Fred J. Tabery, 3443 S. Hill St., Los Angeles 7, Calif.

Atlantic City, N. J. *October 19–23*

Eighty-seventh Annual Meeting of the American Public Health Association (Convention Hall). American Public Health Association, 1790 Broadway, New York, N. Y.

Chicago, Ill. *October 19–23*

Forty-seventh Annual National Safety Congress and Exposition (Conrad-Hilton Hotel). R. L. Forney, Secretary, National Safety Council, 425 N. Michigan Ave., Chicago 11, Ill.

Fort Wayne, Ind. *March 15–16*

1960 Northeastern Indiana Safety Conference and Exhibit. Ivan A. Martin, Safety Council Manager, Chamber of Commerce Building, Fort Wayne, Ind.

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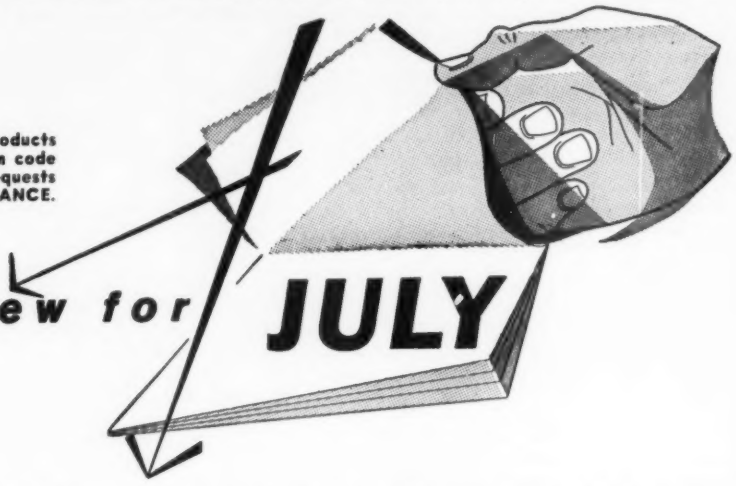
To obtain descriptive literature of products listed, use Reader's Inquiry Card. Write in code number given each item. Send written requests to: Service Dept., SAFETY MAINTENANCE.



what's new for JULY

FLOOR SLIPPERINESS TESTER

(Use Key # 888 on Inquiry Card on page 1)

A NEW floor surface tester, manufactured by the Frazier Engineering Co., is designed to give an accurate measurement of the slip-resistance coefficient of any kind of surface. The Slip-Meter is made of spark proof metal and can be used safely in hazardous areas, such as industrial plants, refineries, and hospitals, as well as in office buildings, the manufacturer reports. The instrument is compact and portable, and readings can be made quickly and easily by any person. Slip measurement is computed by moving parts which register the culminating point on a scale. The scale is calibrated to record the reading point directly and no further computations are necessary. Can be used on any type of floor to determine whether it is slippery or safe.

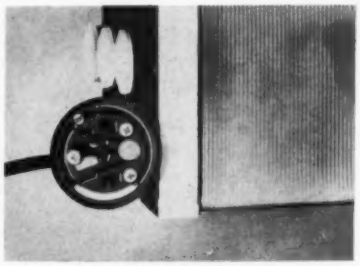
ODORLESS DEODORIZER

(Use Key # 889 on Inquiry Card on page 1)

DISCOVERY of a chemical that will kill odors but has no odor itself has been announced by the National Cylinder Gas Division of Chemetron Corporation. The deodorizer, it is claimed, does not have a perfumed "masking" scent, does not paralyze people's sense of smell but works by fixation, a chemical reaction with the odor itself resulting in complete absorption of the odor.

It is reported effective in controlling residual odors in fish markets, food packing and processing plants, warehouses and stores, and can be circulated in the air of factories and offices or mixed with wash water to scour odor-catching corners. It can also be used for washing and disinfecting dishes, utensils and garments, and can be sprayed directly on wounds or bandages.

The liquid absorbs nearly all odors when sprayed, and is said to inhibit the growth of molds and mildew. Tests have shown that it is non-toxic and non-allergenic and that it will not irritate the skin, corrode metal, stain, burn or explode, the manufacturer reports. The chemical is supplied in aerosol spray containers and in concentrated form.

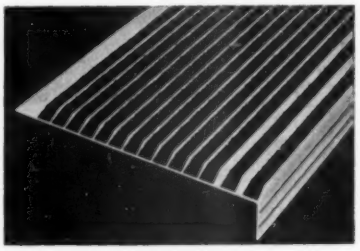


VEHICLE ACCIDENT SWITCH PREVENTS FIRES

(Use Key # 890 on Inquiry Card on page 1)

WHEN A vehicle is overturned, there is danger that an electrical short circuit may ignite gasoline. An automatic safety switch is being marketed by Fyre-Blok Sales, Inc. to immediately break contact between the battery and both the generator and the electrical system if the vehicle turns over or is tilted beyond the center of gravity. The electrical system remains broken until the switch is manually reset.

Suitable for use on trucks, cars, tractors, motorcycles, busses and pleasure boats, the "Fyre-Blok" is a small device with a tough molded plastic body that is attached to the battery. Contact with the generator and electrical system terminals is maintained or broken by the position of mercury in grooved channels within the device. With a tilt or upset, the mercury flows away from the contact terminals; but it is so designed that hills, curves or sudden stops will not cause the switch to function. In the cut-away picture, the vehicle is on its side and the mercury (white) has flowed away from the electrical contacts.



NON-SLIP ALUMINUM SAFETY TREADS

(Use Key # 891 on Inquiry Card on page 1)

A NEW "Traffic-Flow" design for heavy-duty aluminum safety treads has been developed by Wooster Products, Inc. The slip-proof design has a flat abrasive surface that provides a "magnetic-like" feeling, prevents slipping and tripping, and enables handling of large crowds on stairs without accident. The Super Stairmaster aluminum treads are distinctive in appearance to meet decor requirements of department stores and hotels, but are rugged and have passed oil and grease tests more severe than those encountered in most factories and packing plants, it is reported. The treads are 9" wide with beveled back and fit all steps up to 13" wide. Length to 12' as required. A deep 1⅛" nose of heavy aluminum extends over the edge of the step to protect the face. The treads are simply fastened down with screws on wood steps or on masonry stairs with screws and lead expansion shields.

NEW EYE-RINSE BOTTLE

(Use Key # 892 on Inquiry Card on page 1)

A SIMPLE eye-rinse bottle has many advantages of convenience and use in flushing out dangerous substances from the eyes. On-the-job tests have proven that the Advance Eye-Bath Bottle, developed in Europe, offers such advantages for instantaneous application. The pneumatic principle of the bottle has been shown to be equally effective and safe in rinsing for both slight and severe chemical burns.

Advance Eye-Bath Bottles are inexpensive. This means that more of them can be kept throughout the plant where they are immediately accessible; that they are within the reach of "slight hazard" operations and that workers who stand risk of eye burn can even carry one with them at all times. The bottles are simple to clean, unbreakable, and easy to use in any position (standing, sitting, etc.). The American distributor is the Advance Glove Manufacturing Company.

WOMEN'S RIPPLE SOLE SHOE

(Use Key # 893 on Inquiry Card on page 1)

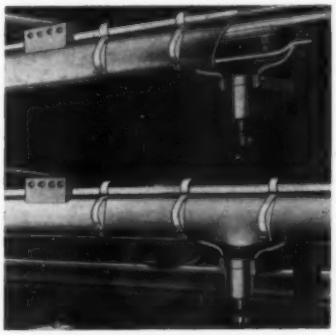
FROM Iron Age Safety Shoes is a new safety shoe for women, No. 603. The new shoe is crafted in soft tan leather and features a "step-easy" ripple sole to appeal to the style and comfort conscious women in industry. The built-in steel safety toe cap gives protection against falling and rolling objects.

LINEMAN'S TWO-COLOR GLOVE

(Use Key # 894 on Inquiry Card on page 1)

AN EXTRA-FEATURE protective glove for high voltage workers is the Charleston Rubber Company's high visibility "Red 'N Black lineman's glove. The new Charco glove has a black exterior and a bright red interior, and is available in regular, curved hand, and contour cuff styles.

A built-in warning feature makes damage detection easier in field or laboratory inspection—if any significant damage to the glove has resulted from snagging or cutting, the black exterior is penetrated and the red interior then flashes its warning that damage is substantial in depth. In addition, this interior color helps prevent inadvertent and potentially harmful reversal of gloves in use and storage, and promotes cleanliness and care by making it easy for the wearer to notice and wash off dirt. The Charco glove is made of pure natural rubber by the standard multiple dip cement process, but instead of a constant series of dips in black rubber solution, the first series is in red rubber.

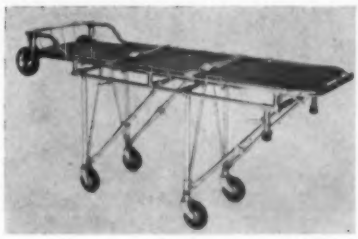


SAFE ELECTRICAL TROLLEY

(Use Key # 895 on Inquiry Card on page 1)

A NEW electrical trolley system of radically different design which is said to provide 100% safety at all times has been introduced by U-S Electric Mfg. Co. Design also is intended to eliminate need for maintenance resulting from foreign matter coming in contact with any part of the system. The U-S Safety Trolley System will carry high amperages required by heavy-duty cranes and similar equipment. Components include an extruded, hard-drawn copper conductor bus; a sliding collector shoe of self-lubricating alloy copper; and a flexible protective sheath covering both bus and shoe. A Koroseal sheath is used for inside applications, Neoprene and Nylon for exterior. In crane bridge electrifications the collector shoes can be mounted on a horizontal plane on minimum spacing of 3".

This copper-to-copper system maintains total area of contact between conductor and collector. This principle together with the covering sheath allow continuous operation despite the presence of dirt, grease, or acid fumes. The system is self-de-icing on exterior installations subject to freezing rain or snow. The system is for installations from 110 to 600 volts. Collectors are for from 70 to 1125 amperes. Five sizes of conductor bus are available, with electrical carrying capacities from 325 to 4500 amperes.



NEW ONE MAN COT

(Use Key # 896 on Inquiry Card on page 1)

PRODUCTION of a new "One Man Roll-In Cot" has been announced by the Ferno Manufacturing Company. The new cot virtually eliminates lifting, enabling one attendant to make long distance and hospital calls alone. Convenient hospital bed height simplifies transfer from bed to cot.

When folded in the car, the new cot lies low for maximum headroom—bed to floor distance is 7½". Compact size allows easy passage through narrow halls, stairs and doorways. Versatile cot also doubles as a two-wheel stretcher by virtue of a locking under-carriage.

Folding-leg action is the key to its unique operation. Attendant rolls cot to open ambulance. When the front wheels roll onto the floor, attendant presses a right hand control, folding front legs. Rear legs remain down, supporting all the weight, until cot's center of gravity is inside the coach. Then a left hand control folds rear legs—cot glides inside.

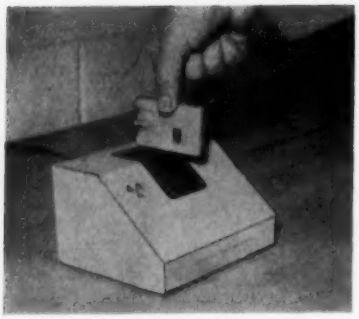
Cot comes equipped with built-in footrest, safety belt type retaining straps with nylon belting, and 1" plastifoam rubber pad. Other accessories available.

AUTOMATIC TEMPERATURE CONTROL

(Use Key # 897 on Inquiry Card on page 1)

DEVELOPMENT of an electronic safety device that automatically shuts off a Banbury Mixer when its internal temperature exceeds a safe limit has been announced by United States Rubber Co. The Banbury Mixer is a batch mixing machine widely used by the rubber and plastics industries. The new device, called the "Banbury Temperature Limiter," was developed by U. S. Rubber's safety and engineering departments, working with the Thermo-Electric Co., Inc.

Development of the temperature limiter began shortly after a major fire occurred in one of U. S. Rubber's plants, in 1955. Investigations showed that the fire was the result of human error. U. S. Rubber set its safety and engineering department to devise a monitoring system that would be automatic, taking away from the operator the decision as to whether danger of fire or explosion exists. The unit is available to industry through Thermo-Electric Co., Inc.



NEW FEATURES FOR FILM BADGE SERVICE

(Use Key # 898 on Inquiry Card on page 1)

CONTROLS for Radiation, Inc., announces new features to their commerical film badge service. Now this comprehensive, highly specialized service contains the latest technical advances in radiation dosimetry and film-badge design. Completely reliable, it offers these outstanding features:

A. The Oak Ridge system of neutron threshhold foil detector can be incorporated within the badge in addition to film packets without any measurement interference.
B. Cumulative quarterly and annual data reports.
C. Microfilming of annual data reports for record safe-keeping and permanent storage.
D. Combination security-photo and film-badge single holder for neutron and beta, gamma, x film packets.
E. Extreme inherent sensitivity—less than 10 mr for hard x or gamma radiation for the total period worn—regardless of length of time up to several months; less than 5 mr for soft x or gamma radiation.
F. Ring or wrist badges are available as well as body types.

A special feature is an electromagnetic opener (shown in photo), supplied free when 30 or more badges are ordered. Timesaving and economical, tamper-proof security features are still retained since only the film-packet is mailed back, not the entire badge.

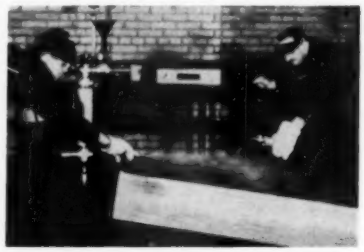
FIRE RESISTANT HYDRAULIC FLUID FOR MINES

(Use Key # 899 on Inquiry Card on page 1)

AN ECONOMICALLY-PRICED fire resistant hydraulic fluid designed specifically for use in all types of hydraulically-operated mining machinery, being produced by the Shell Oil Co., is a water-in-oil emulsion-type fluid with a built-in "fire extinguisher" which smothers fires before they can get started. In addition to recommending the use of a fire resistant hydraulic fluid in mining machinery, the Bureau of Mines has evaluated Shell 3XF Mine Fluid, using test methods that determine fire-resistance properties. The new fluid is supplied as a specially formulated oil concentrate (containing emulsifiers) which is easily mixed with ordinary drinking water. This mixture produces an opaque white emulsion-type fluid which is fire resistant when sprayed out under high pressure. Each microscopic droplet of water is completely surrounded by a tough lubricating film of oil. On exposure to open flame, high voltage arcs or hot metal, the fluid's water content is immediately released as a steam blanket to quench any source of combustion. (See picture.)

The fluid's white color is expected to produce additional economies by reducing present high maintenance costs for make-up of mineral oil. The sharp contrast of the white fluid against dark mining areas will enable workers to more quickly spot leaks.

Shell 3XF Mine Fluid replaces any conventional mineral oil used in existing



lines, pumps, valves and cylinders in mining machinery such as continuous miners and loaders, roof drills and shuttle cars. It will not adversely affect packing materials, seals or hoses and is suitable for use in most vane, piston and gear pumps. The only preparation required is the flushing out of hydraulic systems with the fluid to remove previously accumulated dirt and contaminants.

Shell engineers state that the emulsion type hydraulic fluid has all of the oil characteristics vital to proper functioning of hydraulic equipment. It won't corrode ferrous or nonferrous metal, or attack paints; it is entirely compatible with normal system components; film strength provides excellent anti-wear and anti-scuff protection for closely fitted machine parts; and its physical properties assure maximum hydraulic efficiency over a wide range of temperatures.

MULTI-PURPOSE ULTRASONIC CLEANERS

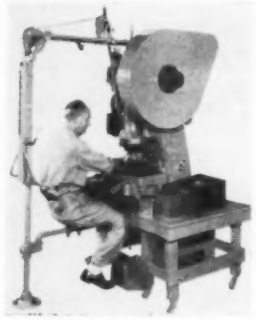
(Use Key # 900 on Inquiry Card on page 1)

A NEW LINE of ultrasonic cleaners is now being manufactured by Circo Ultrasonic Corp. These high speed cleaners are suitable for hundreds of industrial applications including cleaning gears, bearings, instruments, etc., and removing such things as excess solder flux, fingerprints, lint waxes, grease and polishing compounds from parts.

These units introduce the application of sufficient driving power to a precisely designed transducer at the correct frequency, consistently. This power provides tremendous cavitational action and complete uniform coverage throughout the cleaning tank.

Circosonic units consist of a generator and a matching transducerized tank. The generator and tank combination units range in output from 60 watts to 1000 watts and tank capacities from 1 gallon to 20 gallons. All generators are of the electronic pulsed type and give two to four times the energy transmission into the liquid on "Peak Pulse." Tuning is continuous over a wide range. The generators are equipped with a selector switch so that two transducerized tanks may be operated from the same generator. The steel generator cabinets are of functional design with recessed panels, adequately ventilated, and have an easily cleaned glossy finish.

Circo tanks with integral transducers are acoustically designed for maximum cavitation with extremely high energy density to explode off contamination. The Barium Titanate transducers are bonded under pressure to the bottom of the cleaning chamber. All tanks are fabricated from corrosion resistant steel for service with all liquids, and have permanently affixed bayonet type cable connectors.



PULL-BACK SAFETY DEVICE USED FOR MANY JOBS

(Use Key # 901 on Inquiry Card on page 1)

POSSONS Pull-Back Safety Devices, originally designed for protection of punch press operators, are adaptable to toggle presses, embossing presses, press brakes and drophammers, as well as many special machines. If the operator fails to remove his hands from a danger area, the device physically pulls his hands away before the press ram nears the pinch point. There is no jerk or pull unless the operator is in danger.

This pull-back action is performed by steel cored cables, fastened to wrist bands on the operator's hands. The pull-back is actuated by a multiplier, consisting of a gear, rack and cam, connected by a rod to the press ram below any possible breaking point. The multiplier is geared to a 7:1 ratio on the first part of the stroke, providing efficient operation on short stroke presses, or for spring die or drawing applications. The device can be floor-mounted or suspended from either the ceiling or a beam which extends out from the top of the press. Wrist bands can be furnished of leather or a new high-strength nylon webbing.

NON-SLIP PLASTIC COATED GLOVES

(Use Key # 902 on Inquiry Card on page 1)

A PLASTIC COATED glove series, featuring non-slip wet and dry grip, is being manufactured by American Optical. These gloves are particularly recommended for operations where sure grip is needed in the handling of greasy, oily or other slippery objects. The new "Plastifab" gloves are coated with a blend of plastic resins and plasticizers to provide abrasion resistance, flexibility and long wear. They are completely liquid-proof and are reported to stand up under most severe service. The "Plastifab" 2-15 series comes in 6 models and includes choice of full or partial coatings. There are no seams across knuckles or other areas to irritate hands. Wing thumb, fingers and palm are curved to form natural contours. Gloves come in knitwrist, band top or gauntlet styles and in various lengths. Rough texture provides resistance to wear, while snagging and ripping are minimized. All gloves have an 8-ounce jersey lining.

TWO NEW PORTABLE EXTINGUISHERS

(Use Key # 903 on Inquiry Card on page 1)

TWO NEW pressurized wet chemical portable fire extinguishers have been announced by Walter Kidde & Company, Inc. The new 2½ gal. water and 2½ gal. loaded stream portables were designed by Kidde engineers and bear a close resemblance to their new pressurized dry chemical extinguishers. Their designs stress simplified, self-evident operation for anyone picking up a unit in a fire emergency. Simply aim the discharge nozzle at the fire and pull the trigger. Immediately a stream of fire-killing wet chemical goes to work. Other features cited by their manufacturer are: Center balanced, they are easier to carry; rugged pressure gauges, recessed in the handle for added protection, tell at a glance if they are charged and ready for action.

Kidde's new wet chemical portables are approved by Underwriters' Laboratories and Factory Mutual. The water unit is suitable for use on fires in ordinary combustibles such as wood, paper, or cloth, while the loaded stream extinguisher can be used on either ordinary combustible or flammable liquid fires. The new portables' excellent U.L. fire extinguishing efficiency ratings are 2-A for the water; 2-A, 1-B for the loaded stream.

VENTILATED RAIN HOOD FOR SAFETY HATS & CAPS

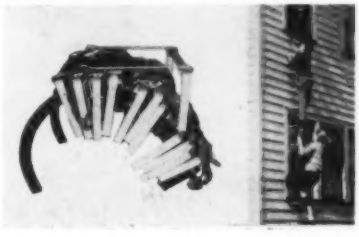
(Use Key # 904 on Inquiry Card on page 1)

A FLEXIBLE rain hood, made of virgin vinyl for low temperature flexibility, is being manufactured by The Fibre-Metal Products Co. The hood prevents rain from dripping down the back of the neck, and provides full 360° ventilation under the crown and through and around the hat or cap suspension. This "air conditioning" leaves the wearer dry and comfortable for better work output. The new Rain Hood R-1 is quick and easy to install in the company's line of glass fibre and aluminum hats and caps, and is easy to remove. There are only 4 points of attachment to the headband and 3 plastic fasteners at its front.

PORTABLE FIRE ESCAPE

(Use Key # 905 on Inquiry Card on page 1)

FYRE-O-SCAPE, a portable metal ladder that can be neatly stored under any upstairs window, provides a portable, fast, safe exit from the top floor of home, school, office, or other building. In case of fire, the ladder is yanked from storage box and the anchor hook dropped over a window sill. The ladder falls into place automatically, and several people can be evacuated within seconds. Constructed of strong, lightweight metal, the ladder, manufactured by State Wide Home Products Corp., is light enough to be handled by a child, yet strong enough to support several persons at once. Specially designed U-shaped flat tread rungs hold the ladder away from the building and keep the connecting chain free to serve as a hand rail. The product is available in 14- and 24-foot sizes.



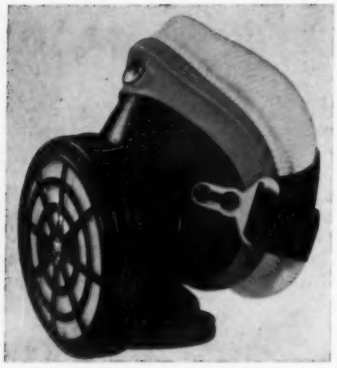
VERSATILE SOLVENT-DETERGENT

(Use Key # 906 on Inquiry Card on page 1)

A NEW cleaning agent, introduced by Tect, Inc., is identified as a "Solterg" because it combines the functions of a solvent and a detergent. "Teclene" is a golden yellow liquid of the viscosity of light mineral oil which forms clear solutions with all chlorinated solvents, most safety solvents, and with water as well. It may be used straight in many cleaning operations to blend completely with oil and grease and may then be flushed off with water. It may also be added to a great variety of other solvents to make them water rinsable. In a reverse manner, it may be used straight or with modest amounts of water to permit rinsing with a chlorinated solvent or safety solvent.

The new agent has no flash point, may be brushed or sprayed on a surface and

allowed to stand for several minutes, and then be hosed off easily with cold or warm water, instantly forming an emulsion which carries with it both solvent-soluble and water-soluble soil. It contains no chlorinated solvents and is considered so low in volatility that the hazard in its use is markedly less than that of solvents commonly used in industrial cleaning. Teclene is highly concentrated for economy and may be used full strength or diluted with 1 to 20 parts of water or chlorinated solvent, as indicated. Although alkaline, the product may be used in the cleaning of all metals and will not attack aluminum. Applications include the cleaning of oil or grease from concrete floors, use in Still tanks, either cold or hot, or in metal parts washing machines for the removal of many different types of soil, and quick emulsification of gasoline, oil, and grease in boat bilges, tremendously reducing the hazards of fire.



MICRO-FIBER DUST FILTER

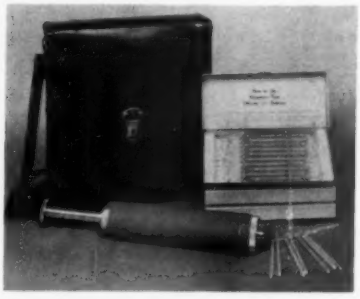
(Use Key # 907 on Inquiry Card on page 1)

A FILTER employing new types of fibers, and approved by the U. S. Bureau of Mines for filtration of dusts in the toxicity range of lead and chromic acid mist, has been introduced by the Pulmosan Safety Equipment Corp. The G-W filter utilizes controlled distribution of micro-fine fibers which form minute webs within a synthetic fiber base. High efficiency is assured by concentrating maximum micro-web formations at the inner surface of the filter and gradually decreasing them to a minimum at the outer loading surface. The full depth of the filter acts to block the passage of dusts and mists. Loading takes place through the depth of the filter thereby reducing clogging to a minimum and increasing the life of its service. Filtering action assures breathing ease, and the filter is unaffected by humidity and solvent vapors. The C-259, C-264 and L-801 respirators, using the G-W Micro-Web filter, are approved by the Bureau of Mines. Shown in the picture is the new L-801 respirator for various dusts and mists and with which the new type filter can be used as well as in older models.

EXPLOSION-PROOF TRUCKS

(Use Key # 908 on Inquiry Card on page 1)

FLAMMABLE fumes or organic dusts in explosive concentrations in the air create a hazard which precludes the use of conventional materials handling equipment. Powered fork lift trucks for such areas must be so constructed that no sparks or flames may be emitted to the ambient explosive atmosphere. Therefore, all motors, switches and similar electrical components must be enclosed in suitable housings. Revolvator Company's present explosion-proof models, are the result of continuing development of new type enclosures engineered to exceed safety requirements and also to provide for more convenient access for service and maintenance operations. Both operator "stand-on" and "walk-along" models of the Go-Getter Series 54.00 are available. The new Model 54.22 high lift straddle-type fork truck incorporates many special features such as anti-kick-back steering and carries Underwriters' Laboratories label (Type EX) for use in Class I Group D explosion hazardous areas.



TOXIC GASES DETECTOR

(Use Key # 909 on Inquiry Card on page 1)

THE KITAGAWA Unico model #400 Gas Detector, manufactured by the Union Industrial Equipment Corp., provides on-the-spot determinations of the concentrations of 36 common toxic gases and vapors. A kit consisting of a hand pump and detector tubes requires no special skill to use. The same pump and operating procedure are employed to measure all concentrations. The pump is a finely machined instrument designed to draw air samples at a reproducible, fixed rate through the detector tubes, insuring reliability of results, regardless of the user. An unbreakable plastic sleeve protects the piston and cylinder from damage. The detector tubes contain a colorimetric chemical reagent which absorbs and reacts with the gas being measured, producing a color stain varying in length or intensity with the air concentration of the gas. Accuracy and consistency of the Kitagawa tubes is claimed to far exceed that of any squeeze-bulb detector, with an average percent error of less than 5% at 68° F.

FIRE-RETARDANT COATING

(Use Key # 910 on Inquiry Card on page 1)

AN EFFECTIVE fire-retardant coating, developed at the Albert Chemical Works in Wiesbaden, Germany, is now available in the United States through American Vamag Co., Inc. This fire retardant material, known as Albert Fireproofing Compound "DS," has been approved by England's Joint Fire Research Organization, Canadian Standards Association, and the Canadian Underwriters' Laboratories. The latter's standards and procedures are identical with those of the United States Underwriters' Laboratories.

The coating not only prevents fire from spreading, but also protects the surface to which it is applied.

In a test with a blow-torch flame at 1800°F. trained on a wood panel for a full sixty minutes, the portion of the panel treated with the Albert "DS" compound was neither damaged nor scorched. The untreated portion burned away completely. Another demonstration is shown in the accompanying picture. A doll house of wood was used in this test. A fire, which was started in the untreated half of the structure, swiftly consumed this section. The other half, to which Albert Fireproofing Compound "DS" had been applied, received little damage.

It can be applied to every kind of building material: timber, hardboard, acoustic board, insulation board, wood chip board, plywood. It prevents fire spread and damage. It can be applied by brush, paint roller, or spray gun, and can be overpainted to provide a decorative finish.

NEW REVOLVING BEACON-LIGHT

(Use Key # 911 on Inquiry Card on page 1)

THE NEW "RAR" Beacon Light is announced by Carpenter Mfg. Co. The low-cost unit features a 50-candlepower bulb mounted in a large 6" parabolic reflector resulting in a new high in light output for a revolving beacon. The glass lens is rubber-cushion mounted in the rugged, non-corrosive aluminum housing. Bulb remains stationary while reflector turns at 70–80 RPM. This high speed permits use of full power without danger of "blinding." The complete unit has been tested in internal ambient temperature ranges from —30°F to 165°F. It stands 8¾" high.

Expressly designed for continuous or frequent use under the most severe weather and vehicle-vibration conditions, the "RAR" is equally adaptable to fire, police, and service vehicles; industrial warning, air field, and advertising applications. It may be mounted on any vehicle roof or used as a stationary beacon . . . indoor or out. Available with either red, blue, amber, or mixed lenses and for voltages of 6, 12, 28, 32 D.C. as well as 115 volts A.C.

"SAFETY MAINTENANCE" MAGAZINE

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NOTE: *Your Safety News* is designed to promote better employer-employee relations. Every item is carefully weighed and tailored to this viewpoint!

INSIDE PAGES
(Pages 2 and 3)

THOUGHTLESSNESS IS A THIEF
He'll steal his way into what you're doing, distract your attention and walk off with a finger, arm, eye or foot. Thoughtlessness takes many forms: it may be daydreaming, or worry about some personal problem, or just plain inattention. Anything that distracts you, especially around machinery, is a thief of your personal safety.
PLAYFULNESS IS A PIRATE
He is a deceptive rascal. His hi-jinks may put him in the spotlight, but his practical jokes and shoving-off often result in serious bodily injury and even death. And note this: he, himself, has lost a leg! As so often happens, horseplay can boomerang and the practical joker gets hurt too!
What You Should Know About Carbon Monoxide
This is a picture of carbon monoxide gas!
That's right, you can't see it. It's odorless, non-irritating, tasteless, practically odorless, but also deadly.
Here are the symptoms of carbon monoxide poisoning: First, a tight feeling across the forehead, followed by headache, throbbing temples, weariness, weakness, dizziness, nausea, loss of muscular control, increased pulse and breathing; BUT if the concentration of the poison gas is high, there may be loss of consciousness without these warning signals.
Just a few breaths of air containing 1% carbon monoxide can be fatal . . . so can one part of carbon monoxide in a thousand parts of air when breathed for 90 minutes.
It is possible for carbon monoxide to leak inside of a car if there is a loose exhaust pipe or manifold connection, blown-out exhaust gasket, cracked exhaust manifold, or leaky muffler. Play it safe:
1. Be sure your muffler and exhaust are in good condition (they can look long before they become noisy).
2. Always keep a car window open, even a little, for fresh air.
AN INTIMATE LOOK AT FOUR VILLAINS
SAFETY LAZINESS IS A SIMON LEGREE
If you are lazy about safety rules, then accidents will have the whip hand. We are safety-lazy when we don't bother to use mechanical guards, to take time to get the right tools for the job, to wear protective equipment such as goggles, hard hats, safety shoes, respirators, gloves, etc. Yes, Simon Legree has a whole pack of accident hounds to trail you.
HAZARDOUS METHODS ARE A HOLD-UP MAN
This villain, unsafe work habits, likes to lie in ambush for the unwary. But how do we fall into bad working habits? It may be by trying to cut corners, by wanting to keep to the old way of doing things, or by over-confidence. It's hard for anyone to believe that an accident can happen to him. It's easier to make excuses to ourselves for ignoring safety rules, but alibis only lead us up a blind alley with an accident waiting in ambush.
Two Excellent Reasons
For Wearing Safety Shoes

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